ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. LXXXVII, No. 25 — Thursday, December 20, 1928

Paper Production Gains During October

Total Production for the Month Was 617,944 Tons As Compared With 546,946 Tons for September and 610,516 Tons for August According to the Reports of Identical Mills to the American Paper and Pulp Association—The Ten Months Production of 1928 as Compared with 1927 Showed an Increase of 3 Per Cent

The total paper production in October was 617,944 tons as compared with 546,946 tons in September and 610,516 tons in August, according to identical mill reports to the American Paper and Pulp Association. The ten months' production of 1928 totaled 5,814,148 tons against a total of 5,667,074 tons for the same period of 1927, an increase of approximately 3 per cent.

Felts and building, news print and hanging papers were the only grades whose ten months' production for the first ten months of 1928 was below the same period of 1927. United States news print production, to date, is approximately 7 per cent below that of the first ten months of last year; felts and building, about 5 per cent; and hanging, about 18 per cent below last year. All the other grades registered increases in production over last year. Shipments during the first ten months of 1928 totaled 5,781,811 tons as compared with 5,635,248 tons in 1927, an increase of about 3 per cent. Stock on hand at the end of October, 1928, totaled 271,906 tons against 254,243 tons at the end of October, 1927, an increase of approximately 7 per cent.

The production of identical pulp mills in October totaled 214,347 tons as compared with 184,173 tons in September and 199,544 tons in August, according to reports to the American Paper and Pulp Association. The ten months' production, to date, totaled 2,074,948 tons as compared with 2,093,300 tons in 1927.

Ground wood production during the first ten months of 1928, as compared with last year, shows a decrease of 4 per cent; news grade sulphite, a decrease of 11 per cent; and easy bleaching sulphite, a decrease of almost 20 per cent. The other grades of pulp showed an increase in production for the ten month period of 1928 as compared with 1927.

The inventory position for the total of all grades improved in October. At the end of October, the total stock on hand amounted to 99,929 tons as compared with 111,210 tons at the end of September, and 129,889 tons at the end of October, 1927. The total decline reflected the decrease in inventory of groundwood, news grade sulphite and sulphate.

COMPARATIVE REPORT OF PAPER OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF OCTOBER, 1928

Grade	Production tons	Shipments tons	Stocks on hand end of month tons
News print	121,613	120,927	36,380
Book	98,418	99,010	53,519
Paper board	237,722	239,368	45,411
Wrapping	54,750	54,068	53,247
Bag	16,381	16,850	*5,210
Writing	31,730	31,824	43,007
Tissue	15,230	15,223	11,538
Hanging	6,292	6,799	3,554
Felts and building	8,744	8,734	2,310
Other grades	27,064	27,562	17,830
Total—All grades	617,944	620,365	272,006

* Revised.

COMPARATIVE REPORT OF WOOD PULP OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF OCTOBER, 1928

Grade	Production tons	Used during month tons	Shipped during month tons	Stocks on hand end of month tons
Ground wood	85,513	92,301	2,848	76,818
Sulphite, news grade	40,145	37,801	2,710	8,506
Sulphite bleached	26,797	24,715	2,671	2,406
Sulphite easy bleaching	3,443	3,044	382	641
Sulphite Mitscherlich	7,048	6,259	857	1,578
Sulphate pulp	26,660	21,567	6,244	4,179
Soda pulp	24,665	15,503	8,636	5,704
Pulp—Other grades	76	.....	90	97
Total—All grades	214,347	201,190	24,438	99,929

United Paperboard Co. Wins Suit

[FROM OUR REGULAR CORRESPONDENT]

THOMPSON, N. Y., December 17, 1928.—Litigation of many years standing between the United Paperboard Company and the Iroquois Pulp and Paper Company over water rights at the Saratoga dam in the Hudson River at Northumberland has been decided by the Court of Appeals in favor of the former company. The decision leaves to be adjusted the amount of damages which will be paid by the Iroquois Company. When the paper board mill was erected there was only a sawmill at the westerly end of the dam. After the sawmill burned the Iroquois plant was erected and the paper board company contended that the new paper mill was entitled to use only the amount of water formerly used by the sawmill and brought action to restrain the Iroquois Company from taking from the river water sufficient to operate the new plant.

Kaydeross Paper Co. Buys Mill

[FROM OUR REGULAR CORRESPONDENT]

BALLSTON SPA, N. Y., December 17, 1928.—Announcement is made of the sale of the Pioneer Paper Mill on Kaydeross Creek, four miles north of this place, to the Kaydeross Paper Company, which is now occupying the property. The mill has been leased and operated by the company for several years and contemplated expansion plans influenced the company's decision to purchase the property. The company also operates the Empire Mill at Rock City Falls and its rapidly expanding business now enables it to take its place as one of the foremost producers of paper products in the Mohawk Valley. The sale of the mill property was transacted by the Ballston National Bank which held a mortgage on the property.

Loads Paper for Atlantic Coast Points

[FROM OUR REGULAR CORRESPONDENT]

LONGVIEW, Wash., December 14, 1928.—The steamer Milako loaded a cargo of paper from the mills for Atlantic coast points November 28.

Joint Printing Committee to Open Bids Jan. 28

Committee Asks Bids on More Than 50,000,000 Pounds of Paper and 35,000,000 Envelopes for the Use of the Government Printing Office for the Fiscal Year Beginning March 1—Awards Will Be Announced by the Committee One Week Later

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 17, 1928.—Bids will be opened on January 28 by the Joint Congressional Committee on Printing for more than 50,000,000 pounds of paper and 35,000,000 envelopes for the use of the Government Printing Office for the fiscal year beginning March 1. Awards will be announced one week later.

According to the report of the Paper Specifications Committee to the Congressional Committee the paper schedule to be opened January 28 contains 181 lots as compared with 184 lots last year and 50,850,000 pounds will be purchased as compared with 50,000,000 pounds last year.

As to envelopes last year there were 82 lots while this year there are only 73 lots. Also last year 50,000,000 envelopes were purchased while this year it is estimated that only 35,910,000 will be needed.

Estimated Quantities of Paper

The approximate estimated quantities of paper for which the bids will be opened include the following:

2,500,000 pounds standard news print paper.
9,370,000 pounds machine-finish book paper.
50,000 pounds antique book paper.
175,000 pounds light-weight machine-finish book paper.
505,000 pounds 50% rag machine-finish book paper.
120,000 pounds 100% rag wove book paper.
3,510,000 pounds supercalendered book paper.
180,000 pounds halftone book paper.
750,000 pounds coated book paper.
170,000 pounds lithograph paper.
2,680,000 pounds mimeograph paper.
700,000 pounds U S M O safety writing paper.
20,000 pounds U S M O writing paper
5,000 pounds safety writing paper.
3,050,000 pounds writing paper.
405,000 pounds map paper.
250,000 pounds chart paper.
835,000 pounds manifold paper.
6,057,000 pounds bond paper.
4,000 pounds parchment deed paper.
980,000 pounds ledger paper.
402,000 pounds index paper.
6,000 pounds tissue paper.
430,000 pounds cover paper.
1,030,000 pounds manila paper.
930,000 pounds kraft paper.
250,000 pounds manila tag board.
1,100,000 pounds calendered tag board.
40,000 pounds manila card board.
395,000 sheets railroad board.
960,000 pounds bristol board.
11,000,000 pounds U. S. Postal Card bristol board.
4,000 pounds paraffin paper.
300,000 sheets gummed paper
235,000 pounds blotting paper.
5,000 pounds stereotype molding paper.
30,000 pounds oiled manila tympan paper.
2,000 pounds plate-wiping paper.
6,000 pounds back-lining paper, for case making.
44,000 sheets pressboard.
2,000 pounds news board.
750,000 pounds chip and straw board.
50,000 pounds marble grained board.
80,000 pounds box board.
850,000 pounds binders board.

Bids will also be opened at the same time for envelopes as follows:

29,257,000 Kraft.
5,148,000 Writing, Sulphite, White and Colored.
110,000 Fine Writing, White and Colored.
345,000 Ledger, White.
890,000 Bond, 50% Rag, White.
160,000 Bond, 100% Rag, White.

Specifications Committee Report

The Specifications Committee, of which F. P. Veitch, chief of the Paper Laboratory of the Bureau of Chemistry and Soils, Department of Agriculture, is chairman, made the following report to the Congressional Committee, which has been accepted on the paper:

The Committee on Paper Specifications respectfully submits its Twentieth Report and the recommended schedule for paper for the public printing and binding and blank paper for the use of the Government departments and establishments in the District of Columbia for the year beginning March 1, 1929. The most important changes which have been recommended in the schedule are submitted herewith as follows:

A watermark design with a symbol designating each grade of rag bond and rag ledger paper covered by the subjointed schedule has been provided this year. The specified watermark design will consist of the seal of the United States with four (★) stars for 100 per cent rag, three (★ ★) stars for 75 per cent rag, two (★ ★) stars for 50 per cent rag, and one (★) star for 30 per cent rag bond and ledger papers. Full sized watermark designs for each grade are reproduced under paragraph 23 of the Instructions in the Proposal. Previously all rag bond and rag ledger papers, except 30 per cent rag bond, were watermarked only with the seal of the United States. This is the first time that watermarks in paper purchased by the Government have indicated the grade of paper. The seal design has also been modified somewhat to simplify the watermark.

The Committee feels that Government activities outside of Washington, D. C., can use these specifications and the proposals advantageously and profitably. It is believed, too, that the general purchase of papers on these specifications by these activities will be beneficial to the paper industry, because in this way the number of kinds and weights of papers will be reduced.

A provision has been made in paragraphs 45 and 46 of the Instructions in the Proposal, permitting that solid or corrugated fiber-board containers may be used for packing writing, manifold, bond, ledger, and index papers having an area of not more than 1,000 square inches and weighing not to exceed 175 pounds per package. These fiber-board containers must be of such quality and so constructed as to insure satisfactory delivery.

A thickness requirement has been included in the specifications for standard news print, machine-finish book end paper, antique book, coated book, machine-finish lithograph, and mimeograph papers. This requirement is added in order to better control the finish and bulk of these papers.

A new lot, No. 15, machine-finish book paper for use on monotype machines has been added. This paper must be suitable for use on monotype keyboard and casting machines.

Difficulty has been experienced by the Government because of insufficient opacity of some of the book papers. No definite test method numerically expressing the opacity of paper has been specified in the past. The specifications simply stated that deliveries must conform to the standard sample in opacity. The Division of Tests and Technical Control of the Government Printing Office has used the contrast method for measuring the opacity of paper during the past year on all deliveries of printing papers. The method and apparatus have proven satisfactory and furnish a numerical value for the opacity of paper. A minimum opacity requirement has therefore been added to all specifications for printing and mimeograph papers. The contrast method for measuring the opacity of paper is described in the PAPER TRADE JOURNAL, Volume 87, No. 10, September 6, 1928, page 64, and is the method adopted by the Technical Association of the American Pulp and Paper Industry.

A requirement specifying the minimum per cent gloss as determined with the glarimeter for supercalendered and coated book papers has been added to the specifications. The surface and finish of these papers is of importance in order to obtain satisfactory results with half tones. It should be stated, however, that the measurement of gloss alone has not been found sufficient for insuring a satisfactory surface on paper for printing and lithographing. The paper must possess a uniform surface.

The gloss requirement has been eleminated from the specifications for map papers, as experience during the past year has indicated this test to be unsatisfactory for insuring the uniformity of surface necessary for wet and dry process lithograph work. The specifications for machine-finish lithograph and map papers have been modified so as to require that the paper shall be suitable for wet or dry process lithograph printing on both sides of the sheet.

Specifications for 100 per cent rag book paper, wove, of the highest quality, have been included in the schedule, lots 24 and 25. The specifications for this paper require the use of new, unbleached, white, or cream cotton or a mixture of cotton and linen rags and that it must be made with every precaution to insure maximum serviceability and permanency. Paper of this quality has been purchased heretofore in the open market.

A definite acidity requirement has been added to the specifications for both 100 per cent rag book and 100 per cent rag ledger, limiting the acidity contained in these papers in order to prevent deterioration resulting therefrom.

A folding endurance requirement has been added to the specifications for 100 per cent rag manifold paper, lots 78 through 81. The bursting strength requirements have also been increased. This paper is used for permanent records, and with these modifications the highest quality of this grade paper should be obtained.

A new lot, No. 205, for 50 per cent rag laid cover paper has been added to the schedule. Under this lot it is desired to obtain a good quality of distinctive cover paper for special uses, for which the regular stock cover papers are not suitable. The specifications are based on manufacturers' standard colors, finish, and laid designs.

A folding endurance requirement has been added to the specifications for sulphite manila, lots 211 and 212, in order to insure satisfactory quality of this paper, which must be made of coniferous sulphite chemical wood pulp, produced by a slow and indirect cooking process. The bursting strength test alone has proven unsatisfactory for controlling the quality of this paper.

The specifications for stock in rope manila, lots 213 and 214, have been modified to require 100 per cent manila and (or) jute pulp. The specifications previously allowed 25 per cent chemical wood pulp.

Lots 222 and 223, formerly carried under manila tag, have been transferred under wood bristol board and are now scheduled as lots 306 and 310. This paper is of the same quality as that required by the former specifications.

Specifications for postal card paper have been modified so that the allowable moisture content is reduced from 5 to 4 per cent, and the maximum ash content increased from 5 to 10 per cent. Is is believed that these changes will aid the contractor in preventing the curling of postal cards, and have been approved by representatives of the Post Office Department.

The specifications for both No. 2 and best quality binders' boards have been modified as to thickness so as to be in harmony with the density and weight specified. The bursting strength requirements have also been reduced in some instances in view of experience during the past year when these requirements were first introduced.

The specifications for the ink to be used in testing the writing quality of paper and for measuring the absorption of blotting paper have been changed so that writing ink shall be made in accordance with U. S. Government Master Specification No. 164 instead of No. 163, as heretofore provided. The standard writing ink used by the Government service for fountain-pen and general office use complies with Master Specification No. 164. The ink made in accordance with Master Specification No. 163 is a record writing, and is only used to a limited extent in the Government service.

A number of minor changes and additions have been made in order to clarify the specifications, or provide for other weights or sizes of paper or board required for the Government service, or to eliminate those which are not needed. For complete information, the bidder must carefully consider the detailed requirements under each class of paper.

We wish to emphasize that it is important that paper manufacturers acquaint themselves fully with the requirements for opacity, and other changes made in the specifications this year, in order to avoid misunderstanding. The Division of Tests and Technical Control of the Government Printing Office will furnish paper manufacturers, upon request, further details as to the methods of test and testing apparatus covered by the specifications, and will test samples submitted by prospective bidders and furnish information as to how such samples compare with the requirements of the specifications provided such samples are submitted in ample time to allow reports of these tests to be made in advance of the submission of bids. However, no reference to reports of tests on samples which may have been submitted shall be made in the proposal sent to the Joint Committee on Printing.

Ask Lower Freight Rates on Box Board

[FROM OUR REGULAR CORRESPONDENT]

BROOKVILLE, N. Y., December 17, 1928.—Clarence C. Smith, secretary of the New York Development Association, and Attorney George N. Brown, of the firm of Clarke & La Roe of Washington, D. C., will attend a hearing this week before the Interstate Commerce Commission at Sandusky, Ohio. The case is of interest to paper manufacturing firms in Northern New York because it was brought by the Hinde-Dauch Company against a group of railroads alleging excessive freight rates on shipments of box board from the Watertown mill to all points in the Eastern territory. The New York Development Association, Inc., represented by Mr. Smith and Attorney Brown, is interceding in the case in behalf of the paper company and plans to do all that is possible to assist it in winning the case.

The hearing is being held at Sandusky at the request of the Hinde-Dauch Company, whose headquarters are located in that city. Joseph A. Quinlan, chairman of the traffic committee of the Development Association, is scheduled to attend another important hearing this week before the Interstate Commerce Commission in Washington and consequently he asked that Mr. Smith be substituted in his place at the Sandusky hearing. Attorney Brown has represented the organization in a number of cases recently heard by the commission.

Peshtigo Paper Mills Ordered to be Sold

Proceedings Reveal Steps Taken to Reorganize Company and to Take Property Out of Receivership—Purchasers Will Probably Lease Plant to E. A. Meyer Paper Co.—Earning Possibilities Under Reasonable Conditions Demonstrated

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 17, 1928.—Following closely upon the announcement made last week that E. A. Meyer, of Menasha, Wis., had purchased the Peshtigo Paper Company mills at Peshtigo, Wis., comes an order issued in the circuit court at Marinette, Wis., by Judge Henry Graass to sell the plant at a public auction on January 23, 1929. The proceedings there, while not mentioning Mr. Meyer, reveal the steps that are being taken to reorganize the company.

Morris F. Fox, investment broker of Milwaukee, Wis., appeared at the hearing and announced that he and his associates will bid for the property and are arranging to take over the control immediately thereafter. He said a reorganization plan is now being worked out. Mr. Fox heads a committee for protection of the bondholders.

It appears from these developments that capitalists whom Mr. Fox represents will acquire the mills and will lease them to Mr. Meyer. The announcement last week was that the name would be changed to the E. A. Meyer Paper Company.

This is the fourth time the property has been ordered sold at auction, but in the other three instances ranging over a period of more than a year no buyer could be found. This time the purchase arrangements appear to be so definite that the sale will go through, and the mill finally will be taken out of the receivership.

Operation under the receivership has demonstrated the earning possibilities of the company under reasonable and ordinary conditions, but testimony given at the hearing by P. M. Allen, the receiver, and attorneys representing him and the creditors and bondholders indicated that the receivership had been unsuccessful because of the huge overhead in paying for the bonds, and the consequent lack of money with which to buy raw materials. It was shown that if the mills could be sold free of encumberances, a buyer could be found. All lien claimants were notified of the proposed sale and none has objected, according to the testimony.

At the time Mr. Allen took over the plant as receiver on February 5, 1927, the company had a book value of $2,264,960.90. The outstanding securities at that time were: First mortgage bonds $1,114,000; debentures $600,000; first preferred stock $991,000; second preferred stock $230,000; common stock $228,000. On Dec. 11, 1928, the outstanding indebtedness of the company was $1,364,359.57, which is $1,163.03 for each $1,000 bond.

In the order issued by Judge Graass, the property is to be sold free and clear of all encumbrances except tax liens, for the benefit of the bondholders and other creditors. The mills were closed down completely last week. The company has a sulphite mill and a two-machine paper mill.

Menasha Products Co. to Expand

Steadily increasing business of the Menasha Products Company, of Menasha, Wis., formerly the Menasha Printing and Carton Company, has made extensive building expansion necessary. Construction is to be started at once on a two story addition costing approximately $75,000. It will be two stories and basement, and of fireproof construction. The new unit will house the presses of the carton department. This equipment in the past has been located in the main factory building but must be moved to make room for other activities.

D. C. Everest on Commerce Chamber Committee

D. C. Everest, vice president and general manager of the Marathon Paper Mills Company, Rothschild, Wis., and president of the American Pulp and Paper Association, has been named a member of a committee which will organize a State Chamber of Commerce for Wisconsin. Mr. Everest will serve with other prominent men in the state to perfect the organization, which has been agitated for some time.

Movement of Pulpwood

According to estimates made by railroads in preparation for the movement of pulpwood, 11,735 carloads will be freighted into the Fox River Valley. The Thilmany Pulp and Paper Company, of Kaukauna, Wis., will bring in 1,957 carloads. Kimberly-Clark Corporation, of Neenah, Wis., is figuring on 1,600 cars from Minnesota to Kimberly, Wis., and 2,950 cars to its various other mills. The Combined Locks Paper Company, Appleton, will ship in 1,850 cars. These represent the largest shipments, but many cars will be brought in by smaller mills. The Riverside Fibre and Paper Company, Appleton, will not move in as much wood because of an oversupply last season.

Timber Conservation

Conservation of timber in Wisconsin for the future supply of paper mills and lumber companies is meeting with considerable assistance on the part of the United States Government. The national forestry commission has approved three national forest preserves in Wisconsin, the tracts totalling 428,580 acres. The largest tract is known as the Flambeau area and consists of 165,000 acres. A tri-county tract in Forest, Oneida and Vilas counties will be known as the Argonne Forest and will include 151,680 acres. The third is the Moquah area, principally in Bayfield County, and comprises 112,000 acres. Government officials are planning to make an inspection of these areas and will then proceed to establish them as federal preserves.

News of the Industry

Eleven foresters from Wisconsin and Minnesota have just completed a short course conducted at Wisconsin Rapids, Wis., under direction of the college of agriculture of the University of Wisconsin. Methods are taught for the scientific management of timber lands and paper mills were well represented among the members of the class.

An interesting test case is scheduled at Iron River, Mich., and will determine to what extent concerns cutting timber will be required to clean up the lands. Two loggers have been placed under arrest for not removing slashings after cutting timber, as required by the laws of Michigan. The regulations require that all slashings be removed for a distance of 100 feet from a roadway. This is done both for highway beautification and the removal of fire hazards. This is the first instance in which the court has taken action to enforce the law.

An electric generator more than forty years old has been sold by the George A. Whiting Paper Company, of Menasha, Wis., to Henry Ford. It will be moved to Detroit to be placed with the relics of the electrical industry which are being collected by Mr. Ford. The generator was used for about thirty years in the mill.

Jerry Elson, formerly of Marinette, Wis., has been promoted to superintendent of the Continental Paper and Bag Corporation mill at Rumford, Me. He started with the Marinette and Menominee Paper Company as a machine tender and was promoted to tour boss. He was then transferred to Rumford as assistant superintendent. A. G. Stone, manager of the Rumford mills, was also employed formerly at Marinette.

The

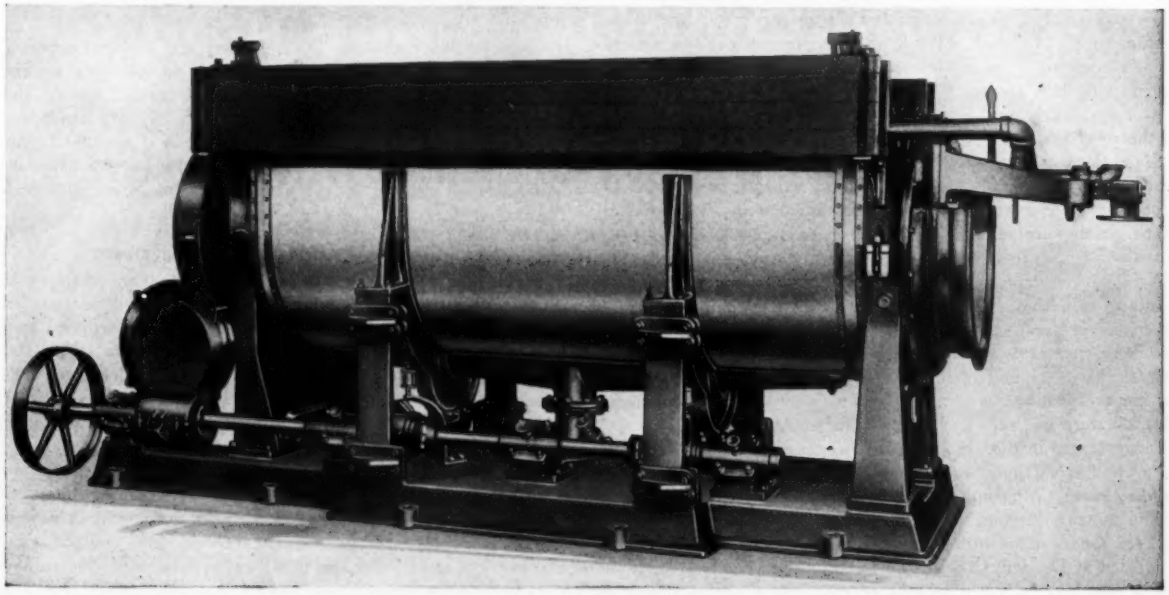
BIRD MACHINERY

BIRD SCREEN

is the screen that has proved itself to be what most paper makers want — let us show you why

BIRD MACHINE COMPANY

South Walpole ◢◤ Massachusetts



2450

News Print Conferences Continue In Montreal

Leaders in Industry Still Endeavoring to Reach Agreement on Pooling of Orders—Announcement of New Price on Contract Business for Forthcoming Year Still in Abeyance—Hearst Contract With International an Important Factor

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 17, 1928.—Although there has been another week of conferences between leaders in the news print industry, the problems relating to the agreement for the pooling of orders do not yet appear to have been settled satisfactorily. That there is some impatience in the matter is indicated by reading between the lines of a statement by the Hon. W. F. Finlayson, Minister of Lands and Forests for Ontario. Mr. Finlayson says: "The news print manufacturers are still meeting and as yet no report has been made to us as to what they intend to do. The situation in the north is unchanged, and while the mills are still working on a reduced basis there is some hardship in the municipalities. So far there is no solution, and the issue is still very much of a problem to the Government."

The difficulty, it now seems to be generally agreed, revolves around the contract made by the International Paper Company with William Randolph Hearst for the supply of news print to his papers at a price stated to be around $51.75 per ton. According to the papers here the International Paper Company has wired to its contract customers that the delay in announcing a 1929 contract price does not involve any departure from its uniform price policy.

Just what this means a host of people financially interested in the news print industry are now trying to figure out. Some think it means that the International will sell news print to all its customers at $51 or $52, and others hope that it means that the contract with Mr. Hearst will be cancelled and a new price set for next year. Whether or not Hearst would consent to reconsider the contract if such is suggested remains to be seen. Certainly if the contract stands and sets the price for 1929, then the earnings of the industry will be seriously reduced and the seed sown for drastic measures in the meantime.

Better Times for Dryden Paper Co.

The Dryden Paper Company has at last been taken out of receivership, the change becoming effective on December 8. J. H. A. Acer, of Montreal, has been appointed president in succession to W. A. Black. While the complete directorate has not been announced, it is understood that Mr. Acer will have associated with him George H. Chahoon, Jr., president of Canada Power and Paper, and F. A. Sabbaton, the latter having been one of the receivers.

Since the company was placed in receivership, a little over five years ago, it has gradually developed an earning power that has wiped out all indebtedness to receivers and has in addition established a fair surplus, and present business of the company is reported as quite promising both in kraft and sulphate pulp.

A further announcement is expected in a short time dealing with a capital re-organization and new financing which is required to cover the cost of additional power that has been developed and for increasing the capacity. Dryden's present capital consists of 100,000 shares of no-par value common stock and $1,100,000 of 6 per cent debenture stock. First lien notes, to an amount of $304,000 were due on October 1 of this year.

Incorporated in 1920, the company is engaged in the manufacture of ground wood pulp, sulphate pulp, kraft paper and board and building paper. Wrapping paper is a profitable part of the business.

The comany develops its own water power and has timber limits of 1,157 square miles in the Kenora district, Ontario, while its plant is located at Dryden, Ont., in the Lake of the Woods area.

The company in recent months entered into a contract with the Bates Valve Bag Company for a five-year period for the supply of kraft paper for the manufacture of Bates bags. This contract, it is understood, will absorb about three-quarters of the entire Dryden output of kraft.

Mr. Acer has long been associated with the paper industry in Canada. He was formerly sales manager for the Laurentide Company. Leaving that company some years ago he formed his own agency for the sale of pulp products, and later on organized the Eastern Pulp Company, which acted for several of the important pulp producers. One of these was the Dryden Company, and it has been from this association that his appointment to the presidency has developed.

Lumber Industry Outlook Brighter

The annual meeting of the Montreal Lumber Association was held in Montreal during the week, and was much more hopeful in its general tone than for some years past. Claude Villiers, the president, said that the surplus of lumber in the eastern part of North America, which had been a decidedly unfavorable factor for years, had definitely disappeared "and a ray of satisfaction shines on the lumber business for the first time in several years."

Contributing factors to this more healthy condition consist in a diminishing cut for the past three or four seasons; the absorption by the pulp and paper industry of large saw mills with their timber limits, which manufactured in the past millions of feet of lumber but have now ceased to operate; four consecutive highly remunerative harvests, which have created a much greater demand for the lumber in the west, thereby reducing shipments of the west coast lumber to the east; and a gratifying increase in the volume of all kinds of business generally.

At the same time Mr. Villiers remarked on the large decrease in lumber exports from Quebec to the United Kingdom. The province was not so long ago the largest exporter of spruce to the British Isles, but, with the increased holdings of the pulp and paper mills, the export trade has gradually decreased.

The following are the officers elected for the ensuing year: President, Arthur H. Campbell, Campbell, McLaurin Lumber Company; vice-president, S. F. Rutherford, Grier Timber Company; secretary-treasurer, H. C. Beatty. The following are the directors: George W. Grier, of George A. Grier and Sons, Limited; E. H. Lemay, D. H. McLennan, of the McLennan Lumber Company, Claude Villiers, of the Canadian General Lumber Company.

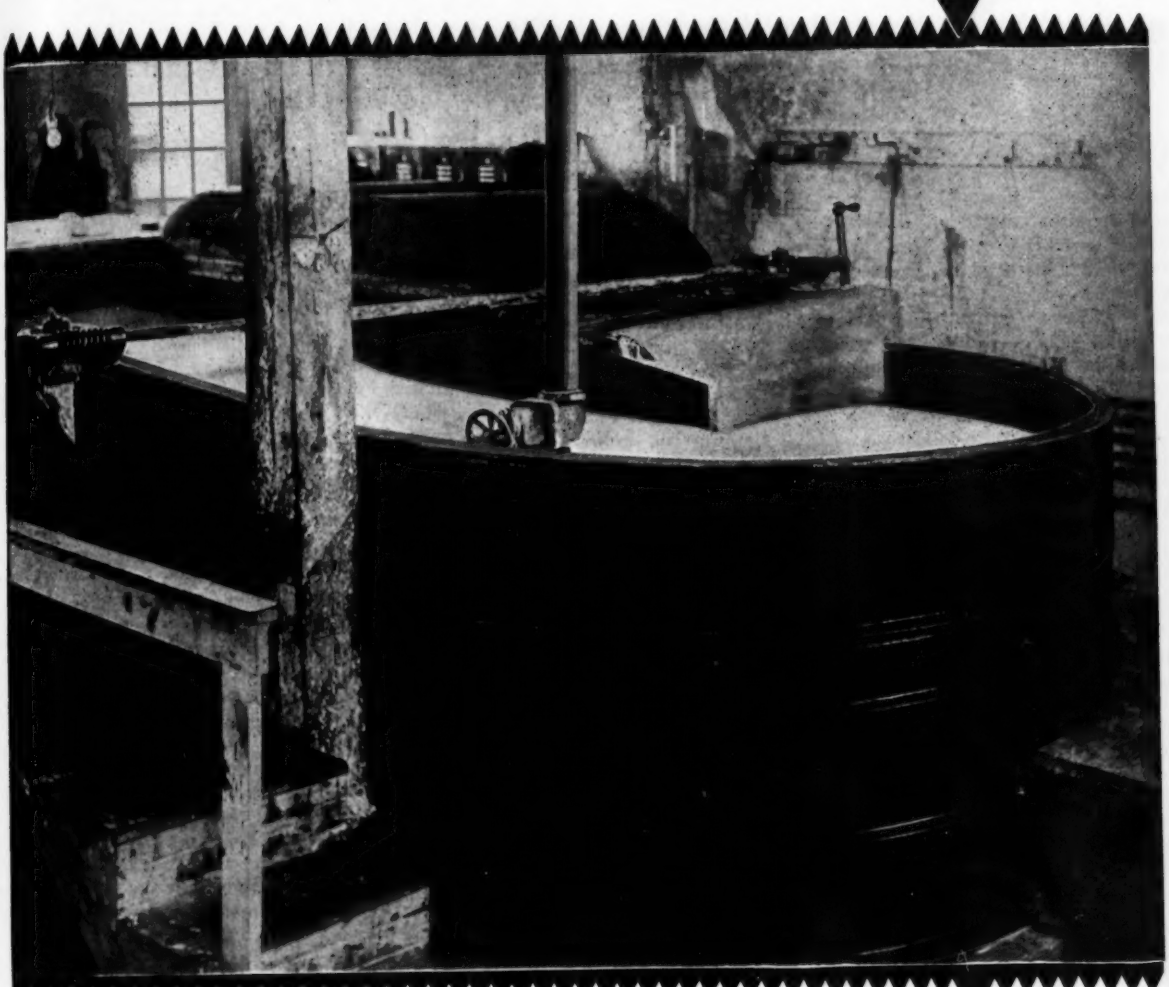
S. F. Rutherford was unanimously chosen as the association's nominee for election to the Council of the Montreal Board of Trade.

Changes in Howard Smith Company

Changes in the management of the Howard Smith Paper Mills, Ltd., manufacturers of fine paper, have just gone into effect. James W. Pyke and J. Alexander Cameron have resigned as vice-presidents, although they will continue as directors, and Harold Crabtree, managing director, has been elected vice-president. E. Howard Smith, Jr., formerly secretary and treasurer, has been elected managing director, and K. G. Pendock will succeed him in his former offices.

The company's plants are operating at capacity, at an annual rate of 38,500 tons. The plant of the Canadian Cellulose Company, a subsidiary, which makes bleached soda pulp, is now operating practically at capacity of 50 tons daily, the output going to the parent company. Later this plant will be expanded to 75 tons

(Continued on page 84)



Increase Your Beating Capacity- Without Increasing Floor Space

IF you need greater output, possibly your present beaters can be rebuilt to obtain the necessary speed and capacity. Aside from being economical, this conserves floor space.

Write for our new 20 page bulletin No. 113 describing our complete line of modern beaters,—no obligation whatever.

DOWNINGTOWN
Manufacturing Company
Downingtown Pa. U.S.A.

Our Products Meet Our Promises

Demand for Paper Fairly Good In Chicago

Fine Paper Market Reported in Better Condition Than at This Time Last Year—Volume Has Increased But Margin of Profit Continues Small — Tissues Are in Seasonal Request With Manufacturers Two Weeks Behind With Orders

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 18, 1928.—A partial crimp was dealt out to the holiday trade in Chicago and its immediate vicinity by Old Man Weather. Warm and rainy weather has more or less subtracted from the general holiday spirit but, despite this fact, business has increased sufficiently to keep the paper houses in fairly good spirits. The news print business continues to be a source of discussion in offices interested in this market.

Book and cover papers are going forward in fair volume with the holiday business almost supplied. Prices continue to remain firm. The fine paper market is only fair though reports have it that it is in better shape than at this time a year ago. The margin of profit continues to be small but the volume has increased slightly but only because of extreme sales efforts being put forth by the paper houses. Tissues are riding the high spots now and mills are reported as two weeks behind schedule due to the splendid seasonal demand. Wrapping paper merchants are also in a more jovial mood as packages containing Christmas gifts are being mailed out. Board continues to decline following its splendid season. The waste paper market continues fairly strong with those items used in the manufacturing of board slightly off.

Jacob Seibert's New Appointment

Jacob Seibert, for many years owner of his own extensive kraft business at 30 North LaSalle street, Chicago, and more recently in charge of the kraft sales of the International Paper Company in the western territory, is reported to be going to New York City after the first of the year to become associated with the New York offices of the International Paper Company. Increased activities in the kraft business of International are said to be responsible for this move.

Mr. Seibert has long been associated with the kraft business, first as the head of the Seibert Paper Company, and later, when his interests were purchased about a year ago, as western manager of the International kraft business. It is no secret that the International Paper Company has made rapid strides in this territory that were largely made possible by the personality and sales ability of Mr. Seibert. His many friends in Chicago and the Middle West are certain that it was a wise move on the part of the International Paper Company to transfer him to their center of activities in New York City.

The Chicago office at 30 North LaSalle street will be left in charge of Miss Nell Ryan who, for five years, has acted as Mr. Seibert's secretary and assistant. She is familiar with the demands of the trade and her knowledge of Mr. Seibert's tactics and of his sales methods are sure to be helpful in keeping the Chicago office on a par with its former activities.

Sulphite Paper Association Planned

Preliminary plans were made at a recent meeting in Chicago to perfect an organization known as the National Sulphite Paper Association according to reports circulating in Chicago paper circles. The meeting was held Wednesday, December 12, at the Palmer House and was attended by twenty-five men interested in the sulphite field who enjoyed a luncheon and spent the afternoon discussing methods of completing the organization of such an association.

It is further reported that nothing absolutely definite has been decided upon by the new association, making it impossible for a complete news account to be given. However, it is understood that many of the organizations interested in the sulphite business have demonstrated their interest in such an organization and that stringent efforts will be made to bring the entire sulphite industry into line. Although nothing definite has been stated it is more or less understood that the association will be in the nature of a bureau cooperating with other organizations in an effort to better conditions in this market.

It is understood that the names of those present are not available until the preliminary organization has been completed. This, the second meeting of the group, was said to be successful and to forecast some happenings of decidedly beneficial nature to the trade.

West Virginia Quarters Changed

The West Virginia Pulp and Paper Company has made a number of changes in its location during the past few weeks. The sales offices of the organization, formerly located at 732 Sherman street, have been moved to the Pure Oil Building, 35 East Wacker Drive, where more than 2,100 square feet of floor space are given over to the efforts and activities of the sales department.

The warehouse has also been moved to new and much larger quarters at 323 West Polk street where the increased space and facilities will make possible the carrying of an even more complete stock than heretofore. The former location at 732 Sherman street will be completely left behind by the first of the year when all of the stock will have been moved to the new warehouse location.

William H. Smyth, sales manager of the West Virginia Pulp and Paper Company, is in charge of the sales offices in the Pure Oil Building. The change was made necessary, both because of an increasing need for warehouse floor space and because it was felt that the needs of customers and sales activities could be better directed from a central sales office practically in the heart of Chicago's newest loop district along Wacker Drive and the river.

Concurrent with their moving, the West Virginia Pulp and Paper Company also issued its price list of stock sizes and weights in standard mill grades sold in the original packing only and effective as of December 10, 1928. Prices are quoted for Super White, Super India, Machine Finish White, Eggshell White, White Bond, Blue Bond, Buff Bond, Pink Bond, Canary Bond, Goldenrod Bond, White Writing, Canary Writing, White Mimeograph, Index Bristol and Cream Post Card.

New Strathmore Literature

The Strathmore Paper Company has recently sent out to the Chicago advertising and printing trade a novel piece of direct mail literature, 7x10 in size and printed on Strathmore Script. The cover carries the legend "An Idea that you'll see through quickly." The cover has been cut in the center with the sales message appearing through the mortise from the second page. It carries an excellent argument for the use of fine papers for letter heads in the belief that they increase prestige and business possibilities.

I. P. Distributes Information on Stock

CORINTH, N. Y., December 17, 1928.—An effort is now being made at the local plant of the International Paper Company to distribute information concerning the fourth issue of preferred stock now eligible to employees on a weekly payment basis. Captains of several units in the mill have been named and it is expected that many employees will take advantage of securing stock by this means. Each share will cost $95 as compared to $100 when the third issue was allotted in 1927. Up to three shares may be purchased by an employee earning $30 a week or under; four shares up to $40 weekly and five to $50 weekly, the issue being graded according to wages.

why they specify Gator-Hide Kraft

PAPER merchants who have sold it know that its greater strength and toughness, its greater wear and moisture-resisting qualities insure customer satisfaction.

Converters who have used it know that these same qualities have enabled them to produce better merchandise at lower costs.

Let us show you how YOU can use Gator-Hide.

Another Certified Product of

INTERNATIONAL PAPER COMPANY

Main Sales Office:
100 East 42nd Street, New York City

Branch Sales Offices:
BOSTON CHICAGO PITTSBURGH ATLANTA PHILADELPHIA

Pennsylvania Paper Mills Slacken Operations

With Exception of Paper Board Plants, Which Continue Active, Keystone State Manufacturers Curtain Operations—Various Grades of Paper Moving in Greater Volume Than At This Time Last Year—While Business Expands, Profits Dwindle.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 17, 1928.—As the volume of holiday demands increase, the dealers are alert to the urgent needs of the mercantile industries in the last minute rush of Christmas shopping. While the prevailing cautiousness of overstocking continues and merchants are only ordering for the immediate future, there is a considerable increase in paper traffic at the moment which bulks larger than in the corresponding period of 1927. Although business expands, profits dwindle with the keenly competed campaigns that are being waged to obtain these belated orders, both by manufacturers and dealers. Wholesalers state that orders are obtainable where prices are right but much haggling over future contracts dominates efforts to secure business in tonnage lots for the coming year. Consumers have been so gratified with the result of their recent efforts to obtain attractive concessions that they are prone to hold off orders until there is a satisfactory price schedule for the larger contracts. Realizing that those dealers who were able to take advantage of mid-summer prices have been able to maintain their autumn sales with fairer profits, the distributors are also holding off pending a more definite evidence of what the paper markets of 1929 are to bring about in the way of offerings from the mills.

With the exception of the board mills, there is a slackening of operation in the local manufacture trade. Board mills are now in the throes of a stimulation that has been spurred by the tremendous competition waged among the giants of the industry. Prices of board have been cut as low as $32 per ton in the drive for orders. This has stimulated buying and consumers are ready to grasp the opportunity to stock freely while the prices are so low. This warfare among board mills smacks of pre-war days when competitive markets created similar price levels. The warfare, however, is confined to the chip and news grades, all others holding steadily to values of the autumn.

This contest for orders among the board mills has been reflected in the soaring demands for all grades of the cheaper stocks that enter into the content of these commodities. Wholesalers of paper stock are besieged with demands for grades that are used in production of chip and news and while the orders are urgent prices have been reduced $1 per ton. This price, however, is believed to be but temporary, as orders now placed will consume all available supplies for the next fortnight. The better grades of paper stock used in board production hold firmly and with scarcity of supplies. There has been a quieter trend to the other grades of paper stock as is customary at this season when mills remain out of the market over inventory time. Solid ledger stocks are scarce and prices have advanced accordingly. Book papers are moving as fast as they can be garnered, although mill buying has slackened. Foreign rags continue to be the most sought of grades in the rag market. Wipers are holding and moving in good volume. Roofing stock is not as active as might be expected. New rags of those grades needed by fine paper manufacturers are being shipped in fair volume.

Fire Destroys Raiguel Warehouse

Fire which started in an adjoining building spread to the sales offices and warehouses of the M. O. Raiguel Company, wholesalers of paper stock, at 111 North Water street, completely gutting the upper floors and doing considerable damage to the supply of old paper stocked on the ground floors. The fire, which resulted in the destruction of the Raiguel headquarters, originated in the adjoining building, where a large quantity of oils and paints had been stored. Damage to stocks amounted to more than $10,000, all of which was covered by insurance.

M. Oliver Raiguel, head of the firm, is one of the best known paper stock dealers in this section, having been linked with the industry for more than two score years. He is the Nestor of the wholesale trade, and has been instrumental in promoting the welfare of the stock branch of the industry as an official of the original Philadelphia Paper Stock Dealers Association. Mr. Raiguel has secured temporary quarters with the International Trading Company, another wholesale paper stock concern, at 334 South Delaware avenue, which will be occupied pending acquisition of a new location for the business.

Peter DeSanti Retires From International

With the retirement of Peter DeSanti from the wholesale paper stock industry and membership in the International Trading Company, 334 South Delaware avenue, the business will be taken over by his associate in the partnership, Thomas A. Kenney. The business will be continued by Mr. Kenney, who is president of the Wholesale Waste Merchants Association of Philadelphia.

Northampton Paper Mills to Be Sold

An announcement made during the week in the local press and through flyers sent out by Samuel T. Freeman & Co., auctioneers, 1808 Chestnut street, states that the Northampton Paper Mills, located on the Easton Pike, Williams Township, near Easton, Pa., will be placed on the auction block on December 20. The public sale of the property, machinery and stocks of the Northampton mills will be disposed of under receivership proceedings which followed the bankruptcy of the firm last summer. The mills were devoted to the production of sanitary tissues and crepe papers and their conversion into towels and napkins. There are 27½ acres of land improved with a manufacturing plant of 40 by 225 feet, residence, houses and other structures. The equipment consists of 8—75 and 100 h.p. beaters, 24 cylinder and 8 cylinder paper machines and dryers, tanks, scrap, electric motors, 75 tons of coal, quantities of paper, pulp, sulphate, dyes and lumber, office furniture, Pierce-Arrow 3-ton truck and other accessories. Edward J. Fox, Jr., is trustee, while Howard A. Lehman, Bethlehem, Pa., is attorney for the receivers. The auction will be held on the premises at 10 a.m.

State Owned Paper Mill Voted Down

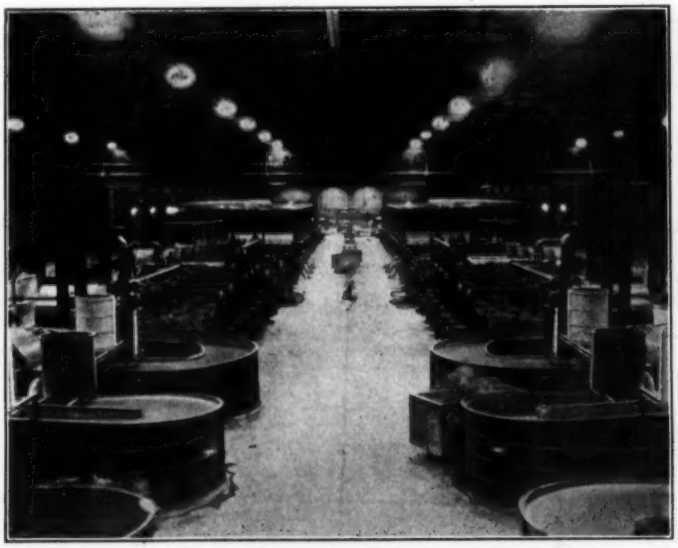
Following an announcement from Harrisburg, Pa., of the complete official figures of the recent vote on the 14 proposed amendments to the State Constitution, four of which were approved at the November election, it was shown that State controlled graphic arts enterprises were not popular measures for the average voter. Amendment No. 1, which involved State operation and ownership of paper mills in conjunction with a printing plant to be run by the State of Pennsylvania, and for various other departments that are linked with the industry in order to effect a saving, was defeated by a total of 721,318 against 309,930 in favor of the measure. The amendment, which was put to vote, was opposed by the Typothetae, the Paper Trade Association and the Chamber of Commerce and Manufacturers' Association. The State ownership of these enterprises would have taken from the allied industries much business which can be handled at lesser cost by those who are in practical contact with these trades than could have been accomplished under local government control. Another measure which was not adopted and that eventually would benefit the in-

LOOK FURTHER SOUTH

LOOK TO MOBILE for the latest International mill: three big Kraft machines and a full equipment of Dilts New Type Beaters.

LOOK TO Bastrop, Camden, Bogalusa, Hodge, Tuscaloosa, all big Southern Kraft mills, and all making paper in Dilts New Type Beating Engines.

"Your paper is made in your Beaters"



Dilts New Type Beaters in Camden mill

Dilts
MACHINE WORKS, Inc. FULTON, N.Y.
EXPORT OFFICE - 15 PARK ROW - NEW YORK CITY

dustry is the amendment providing for a sum of $25,000,000 State Forestry Loan for the development of and reforestation of timber lands in Pennsylvania, an industry which many years ago was a leading factor in the Keystone State and its supply of pulp to the paper making fraternity.

Diamond State Fibre Co. Makes Celleron

The radio industry has developed a specialized branch for products made by the Celleron Company, subsidiary of the Diamond State Fibre Company, of Bridgeport, Pa. This branch of the industry which is attached to the main plant in Bridgeport, is producing a varied assortment of celleron parts used by the manufacturers of radio and by automobile manufacturers. They include celleron panels, bases, sockets and other commodities used in the erection of radio sets. The factory in Bridgeport has been run at capacity the entire season on these specialized lines with many orders from nationally known manufacturers of radio devices and automobiles.

Gypsum Co. To Start Building

Permit has been issued for the erection of a one story plant for the United States Gypsum Company, at 58th street and the Schuylkill River. This structure will be one of the series of buildings which will be erected by the company here, among them a paper board mill. The first unit of the mill is 94 by 198 and will cost $120,000 and work will start this week. There are several acres of land in the plot which will be devoted to construction of the eastern mills of the company. A paper building board mill will be erected upon completion of the present unit.

Chatfield Paper Corp. Organizes

At a called meeting of The Chatfield & Woods Company on December 7, 1928, President W. H. Chatfield announced a reorganization of the company which would become operative January 1, 1929. The Chatfield Paper Corporation has been formed under the laws of the State of Ohio to carry on the business of The Chatfield & Woods Company from its Cincinnati office. The latter company will continue in operation as a holding company, having subsidiaries in various points of the Middle West.

Mr. Chatfield stated that the sole reason for the incorporation of the new company was to give the employees an opportunity to participate in the ownership and profits of the business as a reward for their loyal and faithful service over a long period of years. Among the personnel of the company, there are three men who have been with the company over forty-five years, and of a total of approximately one hundred and forty employees, twenty-six have been with the company over twenty years.

It is understood that the new corporation will have a total value of $650,000.00, represented by 10,000 shares, of which 25 per cent will be open to purchase by employees on terms which will make it available to all. The other 75 per cent will be retained by the old company. The total volume of business done by the corporation runs about $12,000,000 annually. No change in the managers or officers is contemplated, it was announced. This is believed to be the first instance in the paper industry of all workers being given an opportunity of participating in the ownership and profits of their business. Well over half of the organization has responded already to this offer.

The business of The Chatfield & Woods Company had its inception in the year 1832, under the direction of F. C. Goodman, becoming shortly after that a partnership under the name of Goodman & Nixon, and in 1853, Nixon & Chatfield. In 1859, it became Nixon, Chatfield & Woods; in 1865, Chatfield & Woods; and in 1890, under the laws of the State of Ohio, was incorporated as The Chatfield & Woods Co.

William Henry Chatfield, first member of the family in the paper business, died May, 1889. Albert Hayden Chatfield, his son, died March 20, 1919. William Hayden Chatfield, grandson, is now president of The Chatfield & Woods Company, The Chatfield Paper Corporation, The Union Paper and Twine Company of Cleveland, The Union Paper and Twine Company of Detroit, The Chatfield & Woods Company of Pennsylvania, (of which branch he was also general manager in 1916 and 1917, and vice-president in 1919), The Scioto Paper Company of Columbus, director in Metal Aircraft Corporation of Cincinnati, Emery Industries, and Ohio Shares, Inc.

William Woods, first associated with the business in 1859, and first president of The Chatfield & Woods Company in 1890, continued as such until his death in 1902. His son, John S. Woods, first treasurer of The Chatfield & Woods Company, died June 30, 1911; and a second son, Harry F. Woods, first secretary of the company, was elected vice-president in 1902, president in 1919, and chairman of the board of directors in 1928. The present officers of The Chatfield & Woods Company are: H. F. Woods, chairman; W. H. Chatfield, president; T. H. Scallan, whose experience in paper is nationally known, and whose friends extend throughout the industry, vice-president; E. H. Shields, treasurer; and W. C. McLaughlin, secretary. Mr. McLaughlin is also general manager of The Union Paper and Twine Company of Detroit.

During its history the business has covered all items relative to the manufacture and distribution of paper. For many years the old partnership of Chatfield & Woods manufactured paper at a mill at Woodsdale, Ohio, and at the same time carried on a large business in wholesale paper and paper mill supplies. The manufacture and sale of paper bags was an important feature of the company's activities for many years, and was merged in 1890 with certain other bag companies to form the Union Bag and Paper Corporation. Since then—a period of 38 years—The Chatfield & Woods Company has had exclusive selling rights for Union bags in a very large territory.

In the year 1905, The Chatfield & Woods Company purchased a large interest in The Union Paper and Twine Company of Cleveland. In 1907 the Union Paper and Twine Company of Michigan was incorporated in Detroit. At about the same time, the Chatfield & Woods Company started its branch at Pittsburgh, Pa., which business is now being conducted by The Chatfield and Woods Company of Pennsylvania, a subsidiary of the parent company. In 1921, a branch of the Union Paper and Twine Company of Cleveland was opened at Buffalo, and in 1926, The Scioto Paper Company of Columbus was included in the organization. The Company has extensive real estate holdings in Cincinnati, Pittsburgh, Cleveland and Detroit.

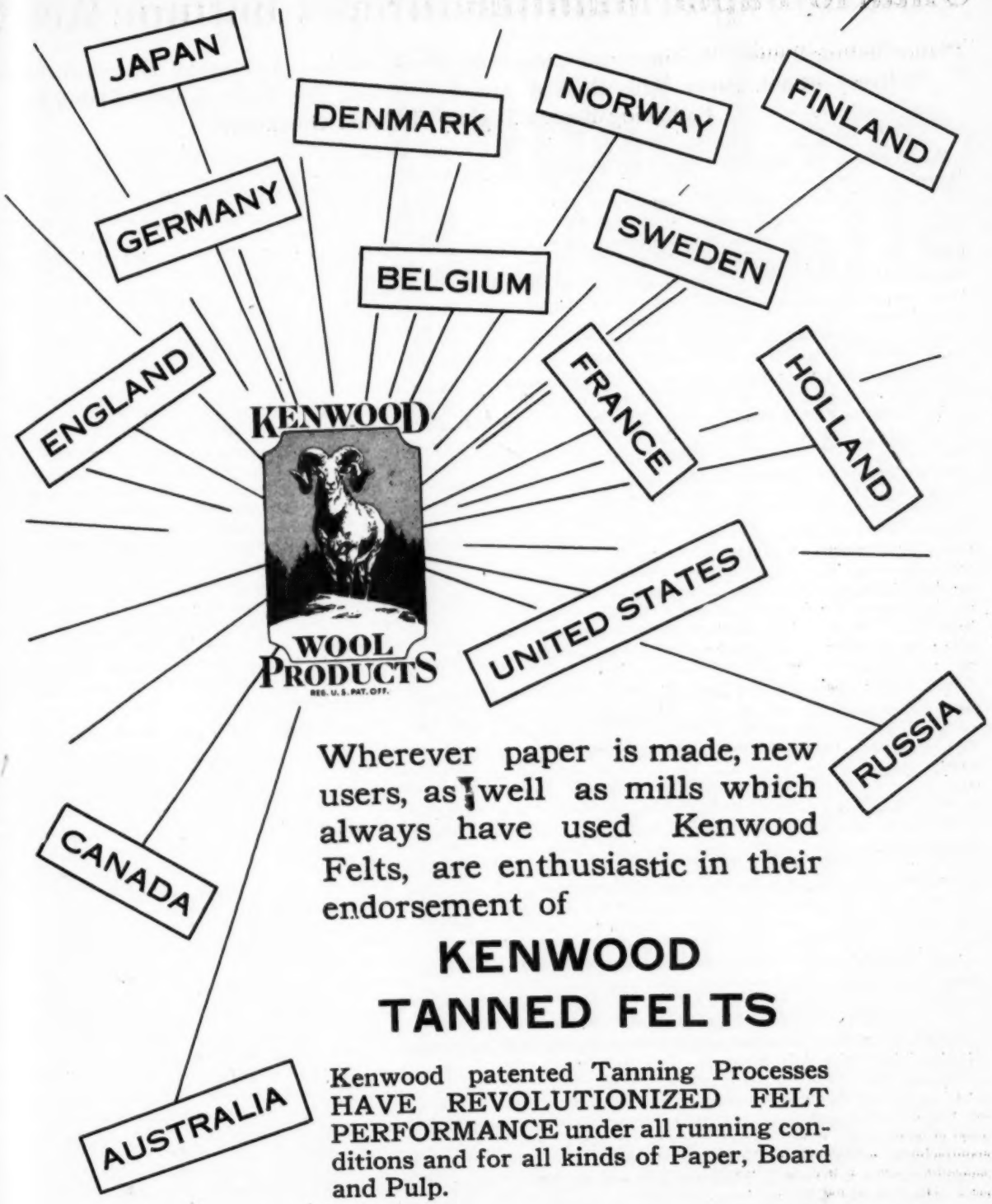
The Chatfield Paper Corporation has been formed to conduct the paper business out of the Cincinnati office of the Chatfield & Woods Company, which will own all of the stock of the new corporation except that being sold to employees. After January 1, 1929, employees of The Chatfield & Woods Company will become employees of the Chatfield Paper Corporation.

The officers of the new corporation are: President, W. H. Chatfield; Vice-President, T. H. Scallan; Secretary and General Manager, W. C. McLaughlin; and Treasurer, E. H. Shields. Other members of the Board of Directors are H. F. Woods, F. H. Chatfield, D. Y. Johnston, H. S. Frazier and C. A. Ragor.

American Writing Not to Transfer Divisions

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., December 18, 1928.—Possible transfer of the Platner & Porter Division of Unionville, Conn., and the Windsor Division from Windsor Locks, Conn., to Holyoke, were denied as an immediate probability by officials of the American Writing Paper Company this past week. The department of tests is, however, to be transferred to the Wauregan Division. The story denied was to the effect that the Platner & Porter Division would take the space vacated by the Department of Tests and that the Windsor Division would be transferred to the George C. Gill Division.



Wherever paper is made, new users, as well as mills which always have used Kenwood Felts, are enthusiastic in their endorsement of

KENWOOD TANNED FELTS

Kenwood patented Tanning Processes HAVE REVOLUTIONIZED FELT PERFORMANCE under all running conditions and for all kinds of Paper, Board and Pulp.

F. C. HUYCK & SONS

KENWOOD MILLS, ALBANY, NEW YORK
KENWOOD MILLS LTD., ARNPRIOR, ONTARIO

Ontario Paper Manufacturers Continue Active

Plants Making Bonds, Writings and Ledgers Have Satisfactory Volume of Orders for Future Delivery—Book Paper Mills Booked Ahead Well Into New Year—Coated Plants Busy Following Recent Slightly Reduced Operations.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 17, 1928.—While the first half of December produced good business for the wholesale paper trade the volume is falling off as Christmas approaches. The trade has had a good record of sales practically all through the fall months in nearly all lines and the year will undoubtedly be found to have been a good one, particularly in fine papers, despite a price war in bonds and ledgers which developed during the summer months. When that difficulty got straightened away the fine paper trade in all its branches went on increasing in volume right up until the middle of December and the outlook for business early in the New Year is bright. The coarse paper trade has been slightly less active than the fine paper department but the fall has produced a fair volume of business and one in which individual orders showed an increasing tendency to expand in size. In many cases ton lots have been replacing ream lots and car load lot orders have also been placed. At the moment all branches of the wholesale paper trade are beginning to slacken, following the usual program at this season of the year, for the reason that there is a holiday spirit ten days before Christmas, and the additional reason that in every commercial line there is a disposition to keep inventories down until after the annual meetings of the companies. This Christmas season there has been a much greater demand for fancy papers and fancy boxes, as well as the standard box lines, and box linings and fancy papers for wrapping and gift purposes have had a very large sale. Tissues in both standard lines and crepes, together with paper novelties in towels and napkins, are still having a big sale, and sales of toilet paper distributors have been excellent.

There is well sustained activity in manufacturing circles. Coated paper mills which for a time reported slightly reduced operations are now beginning to get quite busy and satisfactory tonnages are being turned out and disposed of under greater activity among publishing, advertising and direct mail houses. The lithographing trade in centers like Toronto is extremely active, although the printing industry as a whole could handle considerably more business. The larger printing houses are doing well but some of the smaller concerns report rather quiet conditions. Book paper manufacturers, in some cases, have orders booked ahead well into the New Year and their business in current orders and deliveries is good, while mills manufacturing bonds, writings and ledgers are well employed with a satisfactory volume of orders booked for delivery during the coming weeks. Wrapping mills are not operating at capacity but their tonnage has been gradually increasing under a better demand both for wraps and paper bags. Really good business is passing in glassine, grease proof and waxing papers generally and mills manufacturing these lines are busy. Board mills are doing a good business and some of them are considerably behind with their shipments. This is about the time of the year when outside competition begins to show itself but it has not affected the domestic market as yet. Board men expect the United States product on the mark shortly, following the usual program, and it is said that a meeting of the domestic board manufacturers will shortly be held to devise means to meet the competition when it develops. Whether it will take the form of price reductions or not has not been forecasted.

Seeks to Treble $400,000 Award

Argument will not be continued at Osgoode Hall, Toronto, for another week in the appeal of E. A. Wallberg, president of the Lake St. John Power and Paper Company, against the judgment of Justice McEvoy, which allowed Charles E. Campbell, newspaper publisher at Vancouver, who is claimed to have negotiated a contract between the company and the Newspaper and Magazine Corporation, a commission of 1 per cent. On the thirty to forty million dollars worth of news print, this would aggregate about $400,000. Cross appeal was entered by the plaintiff asking that commission of 3 per cent be paid, stating that this is the customary commission. Motion by Mr. Hellmuth for admission of new evidence was laid over until the conclusion of argument. Justice Middleton said: "I cannot believe that there was a verbal contract which would allow the plaintiff about $1,000,000. About $1,000 to $5,000 would be more in proportion." "The price fixed by three other companies for their output determined to a large extent what the company I am representing would receive," said Mr. Hellmuth. "We might have to pay commission on the entire output, amounting to perhaps $600,000 or $700,000, which would be ridiculous. There is not the slightest warrant for such a contract. It was merely a guess of the trial judge." D. L. McCarthy, K.C., appearing for Mr. Campbell, declared that on the strength of the contract, said to have been engineered by his client, Mr. Wallberg, in collaboration with the Dominion Securities, floated an issue of $15,000,000 first mortgage bonds, of $7,500,000 in debentures, and $2,000,000 of 7 per cent cumulative stock. He contended that Mr. Wallberg had practically assured himself of an annual income of $1,000,000 a year. He had obtained a site for a mill and had his entire output sold for ten years, without the price being determined upon the prices set by other pulp and paper companies as formerly, and that his bonanza had been made an actuality through the agency of his client. The case is attracting a great deal of attention in paper circles in Canada.

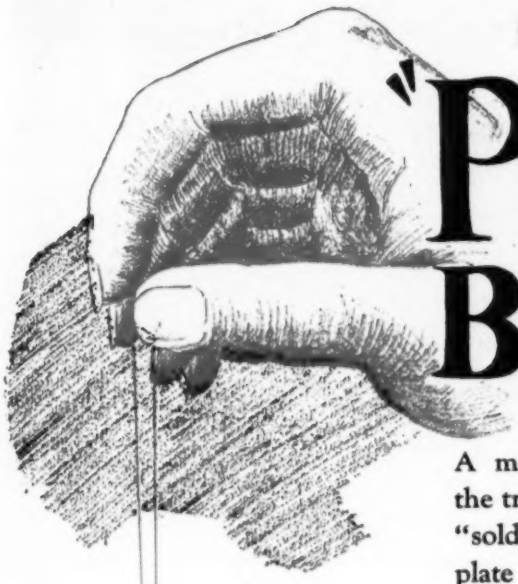
Victoria Paper and Twine Development

A $30,000 additional story over the full top area of the new $90,000 warehouse of the Victoria Paper and Twine Company, Ltd., Wellington street, West, Toronto, has just been started by a construction firm. As originally planned the building was to house only various departments of the company and was to have been two stories and basement in height, 80 by 130 feet, reinforced concrete frame and brick wall construction. The additional story has been leased by another manufacturing firm. The Victoria Paper and Twine Company are large distributors of various paper lines and have a mill at Merriton for the manufacture of tissue, toilet, waxed paper and other lines. Leo Charles is the executive head of the company.

Ask Ad Valorem Duty on Paper

F. M. Kimbark, chairman of the Canadian Division of the U. T. A. Legislative Committee, and also head of the Legislative Committee of the Toronto Typothetae, headed a delegation which went to Ottawa this week to present a further brief to the Tariff Board, designed to induce a revision of the tariff regulations that would bring the Canadian printing industry more into line with present requirements. The brief pointed out that many of the rulings and classifications were obsolete. Representations were also made on behalf of paper which now comes in at 15 cents, and which regulation has been in effect for years to the detriment of the printing industry. Printers are now seeking an ad valorem duty instead of the 15 cents a pound tariff which they claim is now obsolete and should be discarded. The board gave the delegation a sympathetic hearing and there is reason to believe that when the tariff revisions come up again next year, many of the

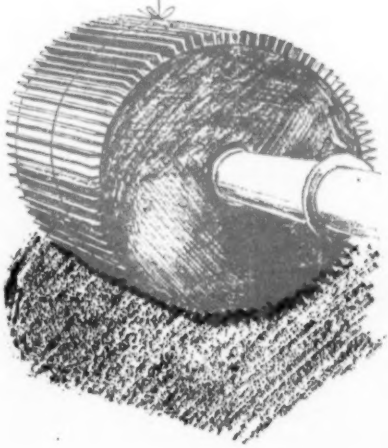
(*Continued on page 40*)



"Plumb-Line" Beater Rolls

A mill whose name you know, if you've been in the trade more than a week, found one of its beaters "soldiering". Investigation showed that roll and bed plate were not properly aligned, and stock needed an undue amount of circulating before it was properly beaten. Adjustment of the bed plate made an immediate, satisfactory reduction in beating time.

Maximum performance in the beater depends largely on perfect contact between the roll and the plate. *Noble & Wood Beater Harness is built to maintain this relation positively and constantly. No matter how much the roll rises and falls, it always returns to its exact position on the plate, without play or side-slip.*



Trunnions are fitted with cast steel boxes in finished ways that control the rise and fall of the roll. A quick lift yoke and lever provide for quick raising of the roll in emergencies. Roll bearings are water jacketed and babbitted with the best copper hardened babbitt.

Every element, down to the smallest detail, is designed and built for strength, rigidity and PRECISION, - - - factors that distinguish ALL Noble & Wood construction. Specify Noble & Wood and insure your equipment against mechanical shortcomings.

NOBLE & WOOD MACHINE COMPANY

Hoosick Falls New York

recommendations will be acceded to. Roy Sales, of Renfrew, Ont., ex-manager of the Canadian Weekly Newspaper Association, and A. L. Lewis, past president of the United Typothetae of America, were also on the delegation.

Corrugated Paper Box Stock Listed

The preference shares of the Corrugated Paper Box Company, Ltd., were called for trading on the Toronto Stock Exchange this week, the issue having been underwritten last May. The Corrugated Paper Box Company originated from a small fabricating plant which was taken over in 1913, and has had a successful record. In May last control of Hilton Bros., Ltd., of Winnipeg, was acquired, and thus a western connection established. It is stated that the company's business during the last six months has been highly satisfactory, and the volume of production recently reached such proportions that a larger factory became imperative to cope with the growing demand for the company's products. To meet this situation a five-acre site was purchased at Leaside, a suburb of Toronto, during the past month, on which a factory having nearly double the capacity of the present plant will be erected. Excavation work will be commenced during the present week. The authorized capitalization of the Corrugated Paper Box Company, Ltd., consists of $1,500,000 7 per cent cumulative sinking fund, redeemable preference shares, par value $100, and 100,000 no par value common shares. Net profits, including those of Hilton Brothers, totaled $106,528 in 1927, and have been running at over three and one-half times preferred stock dividends requirements since the latter part of March of this year, when the present company was formed.

Government Failure as Timber Merchants

Speaking at a public meeting this week the Hon. William Finlayson, Minister of Lands and Forests for Ontario, outlined the work of his department in saving and maintaining the timber resources. "One hundred years ago we had the finest stand of mixed timber in the world," he declared. "The timber and pulp industry is second only to the great agricultural industry of our province, with an income of over $5,000,000 annually. After one hundred years we must admit that as timber merchants we have been lamentable failures. Our white pine will be exhausted in forty or fifty years and it cannot be replaced." He divided the province into three parts and showed the proposed method in reforestation suited to each of these parts.

Paper Interests Fight Stone Duty

Canadian stone producers, chiefly in the provinces of Quebec and New Brunswick, appeared before the Advisory Board on Tariff and Taxation at Ottawa, a few days ago, to ask for a duty of $1 per ton against lime rock and marble coming in from the United States. The application was made by J. S. Clark, of St. George, N. B., and by the Winnipeg Supply and Fuel Company, through D. C. Henderson. In opposition to the application was a lengthy memorandum from the Canadian Pulp and Paper Association, submitted by John Bain, of Ottawa. In anticipating the opposition of pulp and paper manufacturers the stone producers declared that a duty of $1 per ton on limestone would mean very little, if any, to the cost of paper, as a duty of $1 per ton would not mean more than 10 cents per ton to the cost of paper. Pulp mills, the stone producers' brief said, use 350 pounds of limestone to each ton of paper produced. The application is now under advisement by the Board.

Rainy River Pulpwood Sales

A timber berth in the vicinity of Calm Lake Station, Rainy River District, comprising several thousand cords of jackpine pulpwood and a small quantity of jackpine timber, has been sold by the Ontario Department of Lands and Forests to J. A. Mathieu, Ltd. This firm has a large plant at Fort Frances, employing several hundred men in the bush during the winter and maintaining a going concern through the summer season at its mills. The jackpine timber brought $9.50 per thousand feet and jackpine pulpwood 85 cents a cord, which are considered reasonably good prices, having regard to the small area involved and the quantities of timber upon it.

Victor Drury Heads E. B. Eddy Co.

The announcement was made this week that Victor M. Drury, of Montreal, prominent Canadian industrialist and member of various important directorates, including Canadian International Paper Company and the E. B. Eddy Company, had been chosen president of the latter company at a meeting of the board of directors. Announcement of Mr. Drury's succession to the presidency to fill the vacancy left by the death of the late George H. Millen, was made in Ottawa by Mr. Drury himself, just before his return to Montreal. Mr. Drury's appointment has an added significance in the pulp and paper industry of Canada in view of his affiliation with both the Canadian International Paper Company and the E. B. Eddy Company. The Hon. R. B. Bennett, leader of the Conservative party, who has retained his interest in the Eddy company as chief stock holder, was present at the meeting. Mr. Drury will be the fourth president of the $10,000,000 E. B. Eddy Company in Hull. The firm was founded in 1866 by the late E. B. Eddy, and its expansion over the intervening years is one of the industrial achievements in Canada, and particularly of Ottawa and district. The three last presidents have been E. B. Eddy, W. H. Rowley and George Millen.

Canada Board Increases Output

Earnings of the Canadian Paperboard Company at the present time are running in excess of those at the same period last year. The Montreal mill is working at capacity and despite the fact that the Campbellford mill is closed down, the total output of the company is in excess of last year at the same date. This is due largely to the operation of the new mill in Toronto which is producing sixty tons a day. When this mill gets into full swing, the company should benefit materially through economies effected by its large output. Few snags have been struck in getting the big paper board machine tuned up in the Toronto mill. The present daily output is a little ahead of the scheduled production for the present time. Practically a complete crew of new men have had to be trained, but co-ordination in all departments is rapidly being achieved.

Notes and Jottings of the Trade

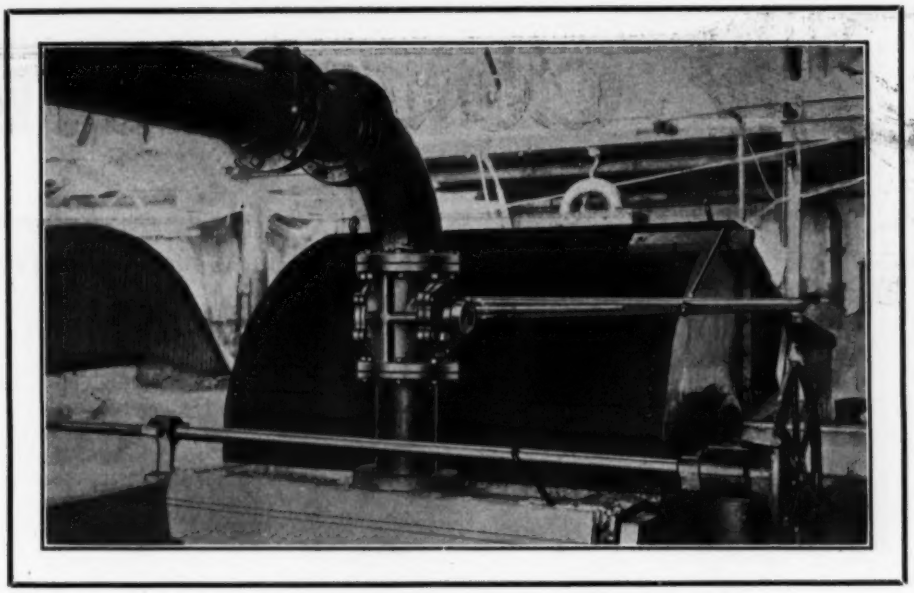
A. Garrison, superintendent of the mill of Dominion Boxboards, Ltd., at Toronto, is leaving that organization to go with the United Paperboard Company of New York. He is being succeeded by W. Crawford, of the Standard Paper Company, of Kalamazoo.

The Hodge-Sherriff Paper Company, selling agents in Toronto and Montreal for the Wayagamack Pulp and Paper Company, have announced that they have moved into new quarters in London, England. Their address is 2, Norfolk street, London, W.C.

H. G. Schanche, manager of the woods operations for the Abitibi Power and Paper Company, who was operated on recently for appendicitis, is convalescing but is still confined to his home.

Returning from a business trip through the Canadian West, George W. Pauline and George C. Winlow, Toronto, state that business conditions throughout the western provinces contain much of promise for the coming year particularly in paper lines. The Alliance Paper Mills, of which they are executive officers, expect to place considerable tonnages of coated paper in the various centers west of the Great Lakes.

"Brighter Parcels Paper" is the trade name for a wide variety of designs of fancy wrapping paper for the holiday trade and is greatly in demand in the stores this season. E. H. Wilkinson & Co., Ltd., Toronto, who are the creators of this attractive series, report an extensive demand by the wholesale trade throughout Canada. The company, owing to increased demand for their products, have opened an additional office and show room in the McKinnon Building, Melinda street, Toronto.



Where There's Not Much Space for Valves Install Valley Plug Valves

It is used under difficult conditions—for places difficult to reach—where there's little space for valves but where valves must nevertheless be placed—for angle positions—that has increased the popularity of Valley Plug Valves. Today over 1200 are in use in paper mills all over the country. Difficult positions do not affect the operation of Valley Plug Valves.

Made to last for years, there's practically no operation nor maintenance cost—and the original installation cost is less than ordinary valves. It's economy to use Valley Plug Valves—either two-way type or three-way type for use where stock must be directed from one pipe line to another.

If you have difficult-to-reach places in your mill where valves must be placed, investigate Valley Plug Valves now—booklet upon request.

Send for this Booklet

It contains information about valves of interest to every mill executive.

VALLEY Equipment Includes

Beaters: Holland and Niagara
Deckers: Single and Double
Agitator Equipment
Screens: Flat and Rotary
Pumps: Centrifugal and Stuff
Cylinder Paper Machines
Voith Stock Inlet
Laboratory Equipment
Stock Valves: 2 and 3 Way
Stock Consistency Regulators
Beater Rolls and Fillings
Digester Fittings of all Kinds

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

New York Office: 350 Madison Avenue

Western Manufacturing and Sales Division: Smith & Valley Iron Works Co., Portland, Oregon

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Fort Wayne, Ind.—The Fisher Brothers Paper Company, 118-20 West Columbia street, is having plans drawn for a new three-story building at Clinton and Columbia streets, to be used primarily for storage and distributing service, reported to cost close to $50,000, with equipment. It is understood that bids will soon be asked on general contract. A. M. Strauss, Cal-Wayne Building, Fort Wayne, is architect. M. B. Fisher is head.

Saginaw, Mich.—The Sears Paper Company is said to have authorized early rebuilding of portion of plant recently destroyed by fire with loss estimated at close to $35,000, with equipment. Reconstruction is expected to cost close to a like sum.

Sandusky, Ohio—The Automotive Panel Board Company, now being organized by D. E. Hokin, 1475 Boston Boulevard, Detroit, Mich., and associates, with capital of 35,000 shares of stock, no par value, to manufacture pressed paper and board products, will occupy a plant at Sandusky, formerly used by the Michel Company, and now owned by Mr. Hokin and Samuel Rosen, the latter of Sandusky. The structure will be remodeled and improved at an early date, and necessary equipment installed. It is purposed to have the new factory ready for service shortly after the first of the year. G. W. Llewellyn and Alexander C. Green, both of Detroit, are interested in the new concern.

West Point, Va.—The Albermarle-Chesapeake Corporation has awarded a general contract to the John T. Wilson Company, Inc., Richmond, Va., for erection of its proposed new mill on local site, to be used for the production of kraft papers, and will proceed with superstructure at an early date. The plant is estimated to cost close to $1,500,000. As recently reported in these columns, contract for a paper-making machine recently was let to the Pusey & Jones Corporation, Wilmington, Del. It is purposed to have the mill ready for production during first half of coming year. The company was formed a few months ago by a merger of the Albemarle Paper Manufacturing Company, Richmond, and the Chesapeake Corporation, West Point. Ellis Olsson is vice-president and general manager.

Holyoke, Mass.—The American Writing Paper Company is reported considering further consolidation of its mills with view to increased production and efficiency. It is proposed to transfer the department of tests and laboratory work from present location at the Mount Tom mill, to the Wauregan Division plant. The space so vacated will be taken, it is said, by the Platner & Porter Division at Unionville, Conn. This latter property will likely be placed on the market following this change. The Windsor Division, now at Windsor Locks, Conn., is scheduled for removal to the George C. Gill Division plant. It is understood that these transfers will be carried out in 1929. Sidney L. Willson is president.

Harriman, Tenn.—In connection with the proposed new mill at Harriman, to be constructed by the Harriman Company, recently organized as a subsidiary of the Mead Pulp and Paper Company, Chillicothe, Ohio, as reported in these columns last week, the company is said to have purchased the plant of the Union Tanning Company at Harriman, and will utilize in connection with the proposed local paper mill. The company has also closed arrangements with the city for a water supply, and test well is now being drilled for this purpose, under the direction of the W. H. Price Company, 1016 North Central avenue, Harriman. J. Phillip Davis, construction superintendent for the parent company, has arrived at Harriman, and work in connection with the project is expected to proceed at an early date. The new mill is reported to cost about $800,000, with equipment.

Marshall, Mich.—The McKenzie Paper Company, 125 West Michigan avenue, recently organized with a capital of $50,000, is said to be planning the early operation of a local plant for manufacture of paper goods of various kinds. The new company is headed by Frank R. Moses and Robert P. McKenzie, both of Marshall.

New Haven, Conn.—The New Haven Pulp and Board Company, East street, has begun construction of its proposed new boiler plant addition, estimated to cost about $48,000, and will have the unit ready for service at the earliest date. A list of equipment to be installed has been arranged. Westcott & Mapes, 139 Orange street, New Haven, are architects.

Adrian, Mich.—The Simplex Paper Company is running on a capacity schedule at its mills at Adrian and Palmyra, and production basis has recently been increased owing to heavy incoming orders. It is expected to hold to present operations at both plants for an indefinite period. Fred P. Wood is president.

East Walpole, Mass.—Bird & Son, Inc., Washington street, manufacturer of paper roofing, etc., has asked bids on general contract for a new addition to its plant, one-story, brick and steel, reported to cost about $40,000. The work will include alterations and improvements in an existing unit at the mill.

Philadelphia, Pa.—Schwartz & Company, 3 Bank street, paper dealers, have leased the entire five-story building at 151 North Third street, and will use for a new nocal plant and headquarters. Portion of the structure will be utilized for storage and distributing service. It is understood that company will remove present establishment to new location, as soon as necessary alterations and improvements have been made.

Oakland, Cal.—The Sunset-McKee Sales Book Company, Oakland, manufacturer of commercial paper goods, has awarded a number of sub-contracts for its proposed new factory on Livingston street, near Cotton street, and will have unit ready for occupancy early in coming year. New awards include reinforcing steel, glass, hardware, and other finishing materials. The plant will cost about $70,000, with equipment. Ellison & Russell, Pacific Building, San Francisco, are architects and engineers.

New York, N. Y.—The Clifton Paper Stock Company, care of J. B. Benedetto, 42 Broadway, attorney, recently organized with capital of $10,000, to deal in paper goods of various kinds, is said to be planning early establishment of local distributing plant.

Los Angeles, Cal.—The Pioneer Paper Company, 5500 South Alameda street, has work in progress on improvements in its storage and distributing building at 387 Hewitt street, and will install additional facilities for handling paper stocks, etc.

As the Fibre is Started the Sheet is Inclined...

This Head Box, with its adjustable lip slice, starts the fibre *right*—an important factor in keeping the sheet *right*. A curved lip at the outlet delivers stock to the wire levelly, evenly. The slice opening, as a whole, is controlled by hand wheels at either end, with delicate precision adjustment at any point across the sheet by means of the smaller wheels. The exact degree of opening is shown by an indicator, while a gauge reveals the amount of stock in the head box. Non-corrosive metal throughout—handsomely designed and sturdily built—the kind of equipment that keeps machine men bragging about performance and appearance.

Bulletin 6S tells all about it. Ask for it.

The Bagley & Sewall Co.

Watertown, N.Y.

New York Trade Jottings

W. A. Wylde, general manager of the Kaydeross Paper Company, of Rock City Falls, N. Y., was a New York visitor.

* * *

Percy Kenyon and J. Melville Alison, of William Kenyon & Sons, Ltd., England, were visitors at the TAPPI headquarters last week.

* * *

The Frank Squier Paper Company has removed to more convenient quarters at 369 Lexington avenue, New York, at 41st street. The telephone number is Ashland 0798.

* * *

The committee on stock list of the New York Stock Exchange has admitted to trading 912,874 additional shares of Class A common stock of the International Paper and Power Company without nominal or par value.

* * *

The Clifton Paper Stock Company, Inc., has been organized and incorporated under the laws of the State of New York, with a capital stock of $10,000, to deal in paper mill supplies. The new corporation succeeds the former Manhattan Paper Stock Company, of 379 Pearl street, New York, and has taken over its assets.

* * *

L. E. McGivena, publicity manager of the New York *Daily News,* addressed the members of the New York Division of the Salesmen's Association of the Paper Industry at its regular weekly luncheon and meeting last Monday, held at the Canadian Club, Belmont Hotel, New York. His subject was "The Future of the Tabloid," and his able and well rendered address was thoroughly enjoyed by all present. No meetings will be held by the association on December 24 or 31, due to the holidays.

* * *

The Twelfth Exposition of Chemical Industries will be held at the Grand Central Palace, New York, the week of May 6 to 11. The exposition has been a leader in the creation, development, and growth of the chemical industries of America, bringing together among its exhibits between 350 and 450 exhibitors displaying their products, which include the varied types like chemical engineering equipment and processes, special machinery as used in the various industries which utilized the exposition to secure new equipment, ideas and inspiration. It embraces in this wide range of exhibits products like apparatus for precise measurement of pressure, volume, flow, temperature, time; laboratory apparatus; supplies, chemicals, etc; the raw materials used in all the chemical industries, the chemicals, dyestuffs, technical materials and chemical products which are applied in the industries and arts.

Paper Men Discover More Boot Leg Ale

CORINTH, N. Y., December 17, 1928.—Seizure of 12,060 quart bottles of Canadian ale camouflaged as wood pulp and concealed in a freight car consigned to Corinth was made by custom inspectors at Rouses Point during the past week. The car had been shipped from Canada to the International Paper Company, but officials of the firm had no knowledge of the shipment. The ale was discovered by Deputy Collectors Shaw and Jones who were making an inspection of all cars entering the yards. This is the second seizure within a fortnight of ale which was being shipped into the country under the guise of pulp.

Ajax Paper Mills To Be Sold

The Ajax Paper Mills, Inc., Buck Run, Chester County, Pa., are to be sold at foreclosure sale Thursday, December 27. The plant contains two 96-inch cylinders and has been making crepe tissues, No. 1 and 2 white tissue, paper napkins and toilet papers for the past 8 or 10 years.

Boston Paper Market Steady

BOSTON, Mass., December 17, 1928.—The situation in the paper market remains generally favorable. Fine paper dealers are booking a good volume of business and there was a slight improvement during the week. Dealers in kraft report orders coming in satisfactorily. Prices are steady.

The price situation in box board is practically unchanged, according to statements in the trade. Wholesale dealers and mill representatives are receiving plenty of orders for board to be shipped within the next thirty days and some mills are said to have enough orders on hand to keep them busy until February 1. Board consumers apparently have a considerable demand for boxes. "It's a hectic time in the low price business," remarked a member of the trade in discussing the situation. It is stated that some mills have not withdrawn the low prices, and yet are not in the market at present. There is a tendency, in some quarters, at least, to restore the former prevailing prices. As is well known, the lower quotations are below cost.

Some grades of paper stock are lower, a fact which may enter into the box board situation to a certain extent, as the costs are thus reduced. No. 1 mixed paper is now quotable at a flat price of .55, compared with a range of .55 to .60, previously named. There has been less demand for old newspapers, now quotable as low as .65. One house quotes .65 to .70 and another .70 to .75. Chip box board is bringing .55 to .60, against a former figure of .65. The supply of these grades has been greater than the demand. Old kraft is also weaker and quotable at 1.85 to 1.90, compared with 1.90 to 2.00. On the other grades of old paper, business is generally steady. In bagging, scrap sisal has advanced from a range of 1.50 to 1.75 to that of 1.60 to 1.80. Rags are reported to be quiet. Foreign lace curtains are bringing 5.25 to 5.40, compared with a former range of 5.25 to 5.50.

Harvesting the Crop

Major U. M. Porter, secretary of the American Paper and Pulp Association, has just made arrangements with Dr. Geo. K. Burgess, director of the Federal Bureau of Standards, whereby the wealth of that Bureau's personnel and accumulated research data, will be more available to the paper industry of the United States.

At the suggestion of Dr. Burgess, Major Porter will serve as the contact man between the Association's Advisory Committee and the Bureau of Standards, thus enabling him to reflect to the committee and, through it, to the paper industry, the results of the Bureau's wide investigations in the character, composition and utilization of paper and its constituents. This arrangement will also make it possible for the industry to bring to the Bureau of Standards its paper problems for such investigation and assistance as its remarkable facilities will permit.

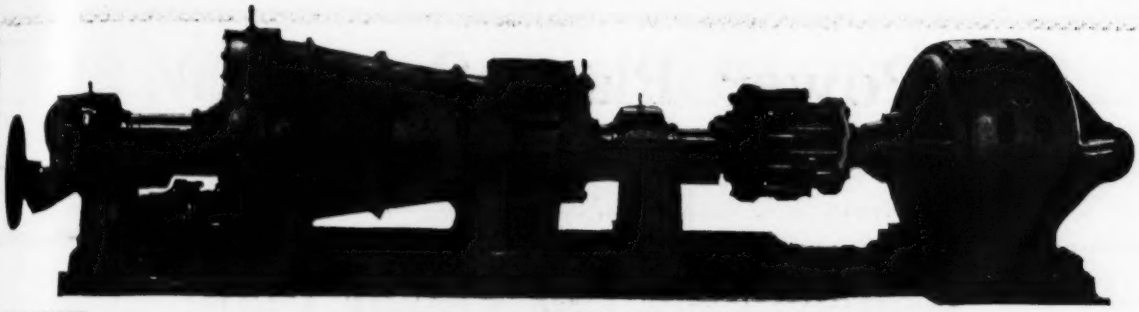
Similar arrangements are being made with other government departments, notably the Department of Commerce, the Department of Agriculture and the various Forest Experiment Stations, as well as with the federal Forest Products Laboratory at Madison, in order that the tremendous crop of research information which has ripened under the direction of federal experts and federal appropriations may be harvested in the interest of the pulp and paper industry of the United States.

J. L. Stille Elected a Director

J. L. Stille, sales manager of Continental Paper and Bag Corporation, a subsidiary of International Paper Company, has been elected a director of the Continental Corporation.

Continental operates plants in Maine, New Hampshire, New York, Pennsylvania, Wisconsin, Michigan, Louisiana, and the Province of Ontario, and has under construction a paper bag plant at Mobile, Alabama.

A complete line of wrapping and tissue papers is made by the Continental, which is also one of the leading manufacturers of paper bags.



THE No. 2 EMERSON JORDAN

is equipped with

TIMKEN ROLLER BEARINGS

A New Epoch in the paper making industry

The No. 2 Emerson Jordan, shown above, is a masterpiece of refining equipment, having Timken Roller Bearings and Bandless Plug. This sturdy, well constructed bearing application is just another characteristic of Emerson Quality and progressive engineering.

Features to Consider.

(1) Timken Roller Bearings, both radial and thrust, are mounted on taper-bored sleeves.

(2) Bearings are enclosed in sealed housings that prevent the bearing troubles generally experienced when bearings are mounted directly on the shaft.

(3) Bearings are NOT mounted directly on the shaft.

THE EMERSON MANUFACTURING CO. Lawrence, Mass.

Power Plant Section

Reducing Power Costs Through Unit Treatment

Conducted by REGINALD TRAUTSCHOLD, Consulting Engineer

Modernizing the Power Plant

Coal Handling—I

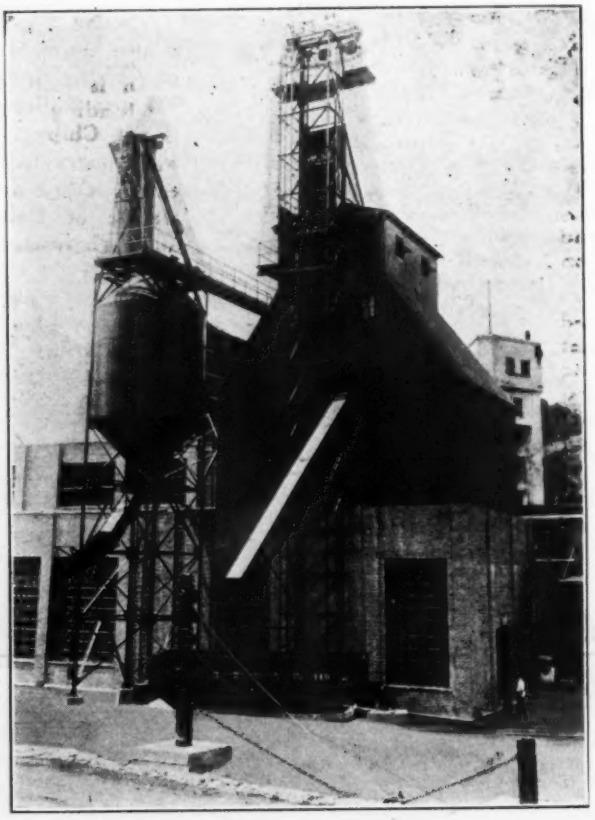
The economical handling of the coal supply is not only a basic consideration in paper making, but a question of extreme importance in the economical production of power. The cost of power production, and this means steam as well as kinetic power, depends even more upon low cost and dependable handling of what may be termed the raw materials than upon any of the subsequent steps in the generation of the energy essential in the production of pulp and paper. If the coal is not handled expeditiously and economically or if an adequate supply of coal is not instantly available when required, the power plant cannot be run economically or the output of the mill produced at low cost. Furthermore, the value of all the power plant equipment and of all the instruments and devices with which the plant may be furnished, with the view of minimizing power costs, are severely discounted.

So important is the handling of the coal supply that if economical production of power is to be realized the first essential is the elimination of the human factor to the utmost, i.e., the installation of dependable mechanical handling equipment. The arduous and exacting task of coal handling, in short, cannot be entrusted to labor. The risk is too great and the cost is prohibitive. Machinery, alone, is qualified.

Not only is the work too much for labor, but there are other considerations. For example, the coal supply is usually received in individual quantity consignments, for an uninterrupted flow of coal from the mines to the boiler grates and in conformity to the furnace demands is not yet possible. The coal customarily arrives at the mill power plant in cars or barges, common carriers which have to be unloaded and returned to their operators promptly in order to avoid substantial demurrage charges. The unloading of cars or barges is almost always an intermittent task for which the mill cannot afford to keep an adequate force of men on hand at all times, nor is it usually possible to arrange to have a suitable unloading crew on call, at short notice, for such temporary work. With suitable mechanical handling equipment, with a capacity of only 50 tons of coal an hour, a couple of men can readily care for seven or eight coal cars a day. By hand, two men could make very little headway in unloading such a shipment. There are, of course, many mechanical handling equipment installations of larger capacity with the aid of which two men could easily handle much more, but probably six or eight cars a day will represent the coal unloading requirements at the average pulp and paper mills, even those maintaining considerable output. It will serve, at least, as a convenient unit of comparison.

An overhead storage bunker, of sufficient capacity to hold a working coal supply providing a safe operating margin, should be provided for the power plant. The coal can be fed to the grates by gravity from above far more cheaply than in any other way. The bunker accommodation may be the only storage necessary, if consignments of coal can be counted upon to arrive whenever required, necessitating only bunker capacity to hold the maximum shipment with a safe operating margin. Facilities permitting, it is far more usual and safer, however, to have supplementary storage from which the overhead bunkers for the working supply can be replenished. The fact that coal can be purchased more advantageously at certain seasons of the year also serves to increase the advisability of maintaining adequate storage reserves of coal, as well as ample working supplies of the very essential commodity.

The coal handling problem consists of getting the coal from point of receipt to the boiler grates, customarily via the overhead coal bunker, whether the coal travels direct from point of receipt or is temporarily deflected to reserve storage. It is possible that the coal has to be crushed, screened or otherwise prepared before it is ready for fuel and it may be, usually is in the modern plant, delivered to the boiler furnaces by automatic stokers or other feeding devices. The equipment involved, the crushers, screens, apparatus for



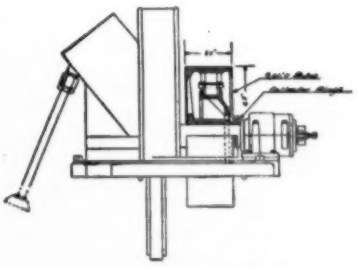
Courtesy: R. H. Beaumont Co.

FIG. 1

Skip Hoists for Handling Coal and Ashes. Cherry River Paper Co.

THE NEW 110-INCH CARTHAGE CHIPPER

Speeds Production . . .
Reduces Power Costs



The 110" Carthage Chipper with direct-connected fly-wheel type of motor. It can also be had with pulley for belt drive.

TWENTY-FIVE cords an hour with one-third less power input than is required for many smaller chippers, is the outstanding record achieved by this new 110-inch Carthage Chipper.

Its large disc of solid steel, weighing more than eight tons and developing tremendous inertia, is carried in special SKF Roller Bearings which, because of their low friction, create a saving in power alone that ranges from 15 to 25 per cent.

The direct-connected fly-wheel type of motor with which this new 110-inch Chipper can be supplied is another outstanding Carthage achievement. It caps more than 30 years of leadership in Chipper manufacturing. It is a feature that will appeal to many because it saves belt expense and power wasted in belt slippage and transmission.

Write for free bulletin giving further information. We make Chippers in 47", 51", 84", 88" and 110" sizes.

Carthage Machine Company

Manufacturers of Pulp and Paper Mill Machinery

Carthage, N. Y. Belleville, Ont., Canada

charging the stokers, the stokers themselves, etc., all form part and parcel of the coal handling system, but the present discussion will be limited for the most part to a consideration of getting the coal from the point of receipt to the overhead bunker.

Assuming the provision of overhead coal bunkers for gravity feed to the stokers or grates, the one customarily accepted essential in advanced coal handling practice, the coal can be brought from point of receipt and delivered to the bunkers economically in numerous ways, making use of quite different types of coal handling equipment. Almost every coal handling equipment installation presents a more or less individual problem and frequently one which can be solved to advantage in more than one way, even though there may be only one best way of doing so. Since the physical characteristics of the coal to be handled are fairly similar, though influenced to some extent by crushing and screening necessities in the preparation of the coal for fuel.

The coal handling problem is an engineering one, not so much from any technical considerations involved, as from an economic aspect. With much high-grade coal handling equipment of various types available and plenty of ability for the layout of a workable coal handling system, unusual care should be exercised in coming to a decision on the variety of system to install. This warning is made advisedly, for the economies which can be effected in coal handling costs by almost any workable system of handling coal mechanically are so marked that quite often the intrinsic value of the system, as compared with that of some other which might be employed, is overlooked.

Complications may, and frequently do, arise which further befog the selection of the best system. If the coal comes by rail, car shortages may prevent the entire consignment arriving in convenient bottom-dump, Gondola cars, or it may be found that coal may at times be more advantageously delivered by water than by rail. The flexibility of the coal handling system is severely taxed, for the coal has to be handled expeditiously and economically whether it comes by car or barge, whether it comes in a Gondola or on a flat car.

The demands of the power house cannot await modifications in the coal handling system to enable it to cope with exigencies of this character, so many of the best coal handling systems for pulp and paper mill power plants, while apparently somewhat crude, are extremely flexible and function at a cost below that which would be entailed for the operation of a more rigid system. The latter, on the other hand, might be preferable for a plant where coal was received regularly, always by the same route and in the same manner.

A description of the many varieties of approved coal handling equipment here, consequently, would serve little useful purpose. Equipment which is distinctly economical in many installations might not be the one best suited for just the mill plant for which it might seem eminently proper, or, as not infrequently happens, errors in judgment might be formed by the reader, not through failure to grasp the significance of the merits of the particular equipment or system, but rather through failure to weigh correctly the factors which might influence adversely the use of the equipment. A far better way of taking up a consideration of coal handling systems for the power plants of pulp and paper mills is to describe installations in individual mills which have proved satisfactory, whether the best or relatively appropriate, presenting detailed and unit cost figures of operation when possible.

Every mill can ascertain its own coal handling costs and should be able to form some opinion regarding the influences imposed by existing conditions. If this can be realized, a mill which might find it is paying 15 or 20 cents a ton for handling its coal supply should be quite interested in the system installed in a mill plant where such costs amount to only 5 or 6 cents a ton. Of course, conditions may not be really comparable in the two plants, but when one expends only 25 or 33 1/3 per cent as much as another for performing a more or less similar task, the plant showing the higher cost should be vitally concerned with discovering why it has to pay such a premium and should be extremely anxious to look into the advisability of improving its coal handling methods. Probably, the minimum in coal handling costs under determinable conditions has not been realized by any mill. What one mill has attained in the line of economical coal handling, another should be able to approach.

Economical Skip-Hoist Installations

An unusually interesting installation is that at the mill of the Cherry River Paper Company at Richwood, W. Va., for the system there, while comparatively new, being installed in 1922, has been in operation a sufficient time to prove its worth and also to make detailed cost records available, such records covering yearly periods of actual expenses under working conditions. The same system, or one very similar, has been installed with gratifying results in quite a number of other pulp and paper mill power plants in this country and Canada. Also, the system has proved extremely flexible, making possible the realizations of economies presented in coal transportation charges in certain installations, permitting modifications in the utilization of the equipment made advisable by the construction of the cars on which the coal is received from the mines at the Cherry River Paper Company and generally accommodating itself to the unanticipated, a most valuable asset for any coal handling system.

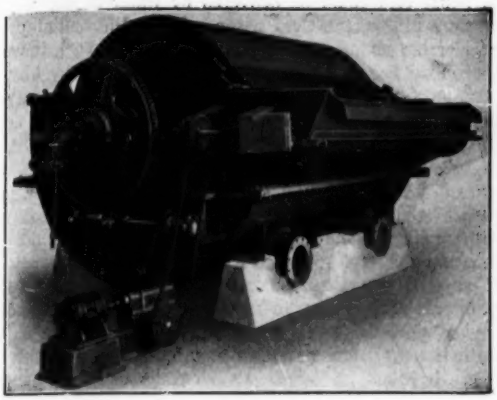
As installed, the system consisted of a commodious track hopper, for the accommodation of bottom-dump coal cars, discharging to a counterweighted, full-automatic skip-hoist rig furnished with an efficient type of loader, automatic control, and in turn discharging to an elevated hopper. A coal crusher was provided and a 400 ton suspension coal bunker located at one end of the boiler room firing aisle. For handling the coal from the bunker to the stokers, a motor driven larry with stoker extension hoppers, etc., is provided. For supplementary coal storage, a cable drag scraper with its drive and full complement of cables, sheaves and other tackle was provided.

COAL HANDLING AND ASH REMOVAL COSTS
Cherry River Paper Company, Richwood, W. Va.

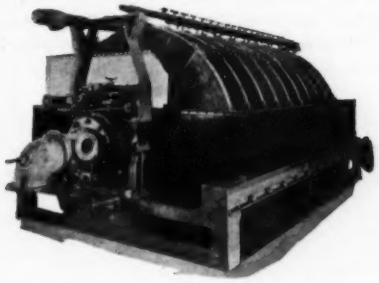
		1926	1927
Coal received (tons)		48,464	50,245
Ashes removed (tons)		7,300	7,500
Operating days		308	310
Labor Costs			
Dumping Coal—Cars to Pit (Locomotive Crane)			
2,772 hours at 44.4c	$1,230.76		
2,772 hours at 41.3c	1,144.83		
2,790 hours at 44.4c	1,238.76	$2,375.59	
2,790 hours at 41.3c	1,152.27		
Handling Ashes—Pit to Ash Bunker			$2,391.03
2,156 hours at 44.4c		957.26	
2,170 hours at 44.4c			963.48
Maintenance and Repairs			
107 hours at 70.0c	74.90		
Labor from M. & R. Department	44.30	119.20	
90 hours at 70.0c	63.00		
Labor from M. & R. Department	81.22		144.22
TOTAL LABOR COSTS		$3,452.05	$3,498.73
Supplies and Parts			
Electrical	14.28		
Mechanical	42.77	$67.05	
Electrical	28.87		
Mechanical	114.81		$143.68
Power Costs			
Handling coal and ashes		$353.78	$366.78
Total Costs			
Labor, Supplies and Parts, and Power		$3.872.88	$4,009.19
Total Unit Costs Per Ton			
Labor costs		$0.07122	$0.06963
Supplies and parts		.00139	.00286
Power costs		.00730	.00730
Total Unit Cost per Ton		$0.07991	$0.07979
Total from Pits		$0.03089	$0.03220

Refuse as Fired

Cherry River coal	8.5 per cent
Saxman coal	10.5 per cent
Williams coal	18.5 per cent



Oliver Continuous Filter Save-all with Re-Pulper



American Continuous Filter Save-All with Water Jet Stock Discharger

Multiply Your Yearly Grind by 5%

—is the value of the stock worth recovering?

UNBIASED estimates put stock losses from mills using ordinary deckers and save-alls at from 5 to 7% of the grind or cook.

Take the lower figure. What does 5% of your yearly output amount to? What is it worth in market value of finished product?

From 90 to 95% of this loss can be prevented by using the proper filters. Oliver United filters are accomplishing these results in any number of mills.

Filters as save-alls are an excellent investment for practically every mill. Consider them for your mill.

Let Oliver United Engineers make a study of your white water problem and make definite recommendations for stopping your losses.

OLIVER UNITED FILTERS INC.

Successor to Oliver Continuous Filter Co. and United Filters Corporation

NEW YORK
33 W. 42nd St.

CHICAGO
565 W. Washington Blvd.

SALT LAKE CITY
Felt Building

SAN FRANCISCO
Federal Reserve Bank Bldg.

LOS ANGELES
108 West 6th St.

London Paris Johannesburg Tokyo Melbourne Halle, Germany
Soevabaia, Java Honolulu Manila Scheveningen, Holland Montreal
Factories: Oakland, Calif. Hazleton, Penna.
Cable Address—OLIUNIFILT

For handling the ashes, which is quite generally looked upon as a part of the coal handling task, a semi-automatic skip-hoist is furnished, with a 50-ton ash hopper. In addition, refractory lined ash hoppers are provided for the five boilers, the hoppers provided with ash gates for the discharge of the ashes to the ash-skip.

The coal skip and crusher, which work together automatically, have a capacity of 60 tons an hour, the cable drag scraper for reserve coal storage one of 50 tons per hour at 100 foot haul and the ash skip-hoist handles 8 tons an hour, the fuel consumed rejecting 8.5 to 18.5 per cent refuse. The cost of the complete coal and ash handling installation erected on foundations and fully wired entailed an investment of about $50,000.

Owing to an extremely unusual situation, the cable drag scraper for supplementary storage, bedding and reclaiming the coal, is not employed. It happens that the mines furnishing the coal supply are owned and operated by the mill and it is possible to maintain uninterrupted shipments of coal to the power plant, making the coal handling operation virtually a continuous task. As the daily coal consumption is only in the neighborhood of 160 tons and the overhead coal bunker has a capacity of 400 tons, there is no need to make use of the coal handling equipment for reserve storage. This, of course, makes the investment in installed coal handling equipment considerably greater than actually required under existing conditions, so burdening the functioning coal handling equipment with a parasitic fixed charge. Another local condition which imposes considerable added expense to the cost of coal handling is the fact that the coal is brought down from the mines in flat bottom cars, necessitating their being unloaded by locomotive crane with a crew of two men, an operator and a helper. This imposes a burden of 85.7 cents per hour for labor, nine hours a day, during the 308 or 310 working days of the year, the greater portion of which would be avoided were the coal received in bottom-dump cars which could be spotted and emptied directly into the track hopper, for which expeditious operation provisions are provided.

In spite of these very substantial burdens upon the coal and ash handling system, imposed by the fact that the coal is hauled over the logging railroad of the paper company, the track construction of which is not sufficiently heavy to permit the use of the larger type modern dump cars, the unit cost of handling coal and ashes amounts to about 8 cents per ton, close to 87.5 per cent of which represents labor which could be avoided in very large measure were it feasible to dump the cars directly into the track hopper. Detailed expense items for operating the system during the years 1926 and 1927, compiled by Elmer C. Smith, chief engineer of the Cherry River Paper Company, are given in the accompanying table, in which the extremely low charges incurred for maintenance and repairs should be noted.

Confirming the almost negligible character of these maintenance items and also substantiating the claim that the employment of bottom dump cars would greatly reduce the cost of handling the coal is the experience of the Ste. Anne Paper Company, Ltd., of Beaupre, P. Q., one of the six or seven prominent Canadian mills where very similar systems of coal handling are in service. In the words of the manager of that concern: "To date (August 14, 1928) we have found the maintenance cost of this equipment negligible. The only items of any amount have been a set of new wheels on the bucket and a length of cable which was necessary because the old cable ran off, and was so cut up as to make the change imperative. Undoubtedly if this had not happened the cable would have been good for some time to come. We estimate our operating cost, including power and labor, at about three-quarters of a cent per ton."

Experience in a large installation on the shores of the Great Lakes is also indicative of the economy of handling coal by means of cable drag scrapers and of the extreme flexibility of the system. This installation was originally laid out to handle coal for storage from rail shipments and for subsequent reclaiming of the stored coal for power plant service. It was discovered, however, that coal could be delivered by water at the wharf of the company at 25 cents less a ton. Such differential promising a considerable saving in the yearly expense for fuel, it was decided to abandon the rail route and receive all coal by boat. It was proposed, furthermore, to install a gantry crane for unloading the boats, such investment being warranted even though entailing an outlay of approximately $100,000.00, when it was discovered that the self-unloaders with which many of the boats on the Great Lakes are equipped could discharge the coal on the wharf within reach of the stocking cable drag scrapers. The flexibility of the coal handling system made the substantial investment in a gantry crane unnecessary.

Commenting upon the installation, the power plant superintendent states: "My opinion of the drag scraper has been considerably changed since using this equipment, as it is dependable, very flexible in its uses, low first cost and for putting coal in storage I believe it hasn't an equal. It is equally as good for reclaiming purposes. We have one stock pile containing approximately 70,000 tons of coal, piled thirty-five feet high, which is uniformly stored regarding coarse and fine coal." Concerning upkeep and maintenance, he further states: "We have had practically no outage of this equipment due to breakdowns, etc., and have found this method of handling coal efficient, very flexible and highly satisfactory."

Some very illuminating operating and cost data can be presented in connection with this installation, based upon placing 200,445 tons of coal in storage and reclaiming 88,158 tons. In this service, the average distance over which the coal was hauled was 300 feet and the average number of tons of coal handled per hour by the system was 76. The average length of the cables employed, two cables being provided per drag scraper, was a matter of 1,290 feet and the average cable life was 750 working hours.

Two drags were used on storage of coal and two on reclaiming, the storage of in excess of a fifth of a million tons of coal requiring 2,638 working hours and the reclamation of nearly 45 per cent of this amount, 1,139 hours. The detailed items of expense entailed in thus moving the coal, resolved to a unit charge per ton, are:

Cost of cable	$0.0086
Cost of maintenance (2 drags)	.0017
Cost of operation (labor etc.)	.0263
Cost of power (1c per kwh.)	.0100
Total cost of maintenance and operation at 300 foot haul	$0.0466

The charges for operation cover the wages of operators, expenses for oiling and cleaning equipment and for the adjustment and the changing of cables.

The outstanding feature of this particular installation is, of course, the marked flexibility of the coal handling system. It is responsible in this instance, not only for making unnecessary what seemed like a perfectly justified investment of $100,000.00, but also for enabling such effective advantage to be taken of the 25 cents per ton reduction differential afforded by the water transportation of the coal that not only is the entire cost of coal storage and reclamation saved but a further reduction of some 20 cents a ton effected in the coal bill. This, of course, on the very reasonable assumption that it would cost just about as much to place the coal in storage and to reclaim it had it arrived by rail instead of by boat.

Suitability of Material Handling Systems

Before taking up considerations of other varieties of coal handling systems which have been satisfactorily installed and operated in pulp and paper mill power plant services, it might be well to draw attention to a peculiarity quite common in coal handling service for the power house, which has to do with the suitability of the essential conveying and elevating machinery. In general, such equipment can be classified in two all-embracing groups: 1, equipment handling its load intermittently, such as skip-hoists,

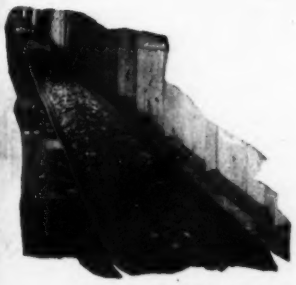
Peck Carrier

SS-850 Chain for suspending and operating barking drums

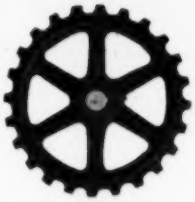
"C" Class Combination Chain

"400" Class Chain

"RC" Class Chain for power transmission



Belt Conveyor



>FLINT-RIM-< Sprocket

Gears of all kinds

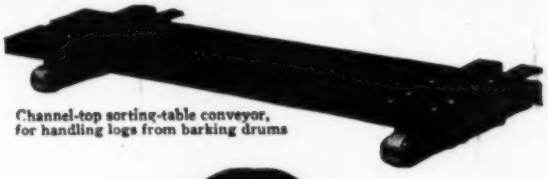
Everything for Handling Materials, and Driving Machinery

EVERY mill should use the new 1088-page Link-Belt General Pricelist Catalog 500, which completely covers in list prices and descriptions, the machinery equipment to keep the mill going. Address the nearest office listed below.

"S" Spur attachment

Friction Clutch

Plain Bearing



Channel-top sorting-table conveyor, for handling logs from barking drums

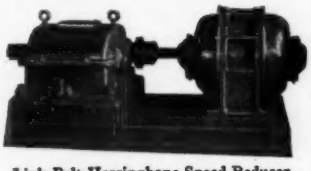
Malleable Iron Safety Collar

>HEXTOP-< Grease Cup

Style "DS" Take-up

Link-Belt Crawler

Link-Belt Silent Chain Drive



Link-Belt Herringbone Speed Reducer (Sykes tooth form)

Chain Conveyor handling logs

LINK-BELT COMPANY

3438

Leading Manufacturers of Elevating, Conveying, and Power Transmission Chains and Machinery

CHICAGO, 300 W. Pershing Road

INDIANAPOLIS, 200 S. Belmont Ave.

PHILADELPHIA, 2045 W. Hunting Park Ave.

Ashland, Ky. Atlanta Baltimore Birmingham Boston Buffalo Cleveland Dallas Denver Detroit Huntington, W.Va. Kansas City, Mo. Los Angeles Louisville Milwaukee Minneapolis Montreal New Orleans New York Oakland Pittsburgh Portland, Ore. San Francisco Seattle St. Louis Toronto Utica, N. Y. Wilkes-Barre

LINK-BELT

cable drag scrapers, cranes of all kinds, hoists and towers, mast and gaff rigs, cars, larries, etc.; and 2, equipment handling its load continuously, such as the many varieties of conveyors proper, elevators and continuous bucket carriers.

Both of these groups are eminently suitable in coal handling service for the power plant, a condition which may not be true for demands in other material handling tasks. Coal is ordinarily received at the power house in quantity consignments, which almost always have to be placed in temporary storage before the coal can be fed to the grates. There is no connection between the rate at which the coal may be unloaded and the rate at which it must be fed to the grates to meet power and steaming demands. For this reason, there is no particular advantage in unloading the consigned coal cars or barges by removing the coal in a continuous and uninterrupted stream, such as would be the case if a belt or other continuous carrier were used. The unloading can be consummated just as well by equipment which loads up with a relatively large quantity of coal, handles it, discharges its load and returns for more, a skip hoist, for instance, or a coal tower with its grab bucket. The dominating consideration is the selection of the equipment which will unload the coal and put it into storage, service bunker or reserve, for the least money, taking into account all direct, indirect and in any way related expenses.

This is an extremely important point for the mill contemplating the installation of a coal handling system, changing to some other system or in any way modifying its coal handling methods. While it may complicate the coal handling problem in a way, by the complexity in choice of equipment procurable which it affords, it also provides the broadness in selection which alone can enable the mill to install the best system for its individual requirements, i.e., if it has the vision to make such selection or can secure expert counsel for guidance. It also explains the reason why a discussion of coal handling equipment for the power plants of the paper making industries is probably of most value if it simply attempts to present brief descriptions of individual economical installations, bolstered up with operating and cost data, as examples rather than recommendations.

(*To be continued*)

German Paper and Pulp Output Higher

WASHINGTON, D. C., December 12, 1928.—German paper production during the quarter July to September totaled 532,665 metric tons (metric ton = 2205 pounds) as against 521,931 tons during the second quarter, and 509,273 tons during the first quarter of 1928, according to the Department of Commerce.

Production of chemical pulp, which amounted to 294,319 tons, was also greater than during the first or second quarters of the year, while there was a slight reduction in the output of mechanical pulp, Trade Commissioner William T. Daugherty, Berlin, reports to the Department.

Board production, which amounted to 110,018 tons, was slightly above the second quarter and about on a level with the first three months of the year. The manufacture of this product is reported to have been adversely affected by low water levels during August and September.

A notable feature in the paper market at present is the heavy inland demand for news print, which is one of the major items of production, and a consequent tendency to delay exports in favor of domestic orders.

Exports of paper and paper products from Germany, nevertheless, were somewhat larger during the third quarter than during either of the preceding quarters.

Pulpwood Consumption and Wood Pulp Production

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 19, 1928.—The Department of Commerce announces that, according to data collected in 1928 in cooperation with the Department of Agriculture, the total consumption of pulpwood in 1927 amounted to 6,659,157 cords, reported by 219 mills. This figure represents a decrease of 1.6 per cent as compared with the consumption in 1926, 6,766,007 cords, reported by 224 mills. The total production of wood pulp in 1927 was 4,313,403 tons, a decrease of 1.9 per cent as compared with 4,394,766 tons for the previous year.

The leading three States in this industry are Maine, Wisconsin, and New York. Decreases are shown for most of the States reporting, important exceptions being Louisiana and the three Pacific-Coast States—California, Oregon, and Washington.

Detailed statistics are presented in the following tables. The figures for 1927 are preliminary and subject to such correction as may be found necessary after further examination of the returns.

TABLE 1

PULPWOOD CONSUMED AND WOOD PULP PRODUCED, BY STATES: 1927 AND 1926

[This table gives statistics for all States for which separate figures can be shown without disclosing operations of individual establishments. Certain of the "All other States," however, reported larger amounts of pulpwood consumed and of wood pulp produced than some of the States shown separately.]

State	Pulpwood consumed (cords)		Wood pulp produced (tons of 2,000 pounds)	
	1927	1926	1927	1926
United States	6,659,157	6,766,007	4,313,403	4,394,766
Maine	1,273,268	1,298,357	942,162	945,790
Wisconsin	1,199,615	1,224,443	690,921	712,565
New York	882,388	990,701	710,227	822,131
Washington	445,664	305,787	268,349	199,164
Pennsylvania	398,021	425,684	216,587	233,258
New Hampshire	358,376	431,138	200,324	248,600
Michigan	351,688	331,570	193,539	200,604
Louisiana	321,272	258,439	179,878	137,571
Virginia	316,032	317,058	170,630	163,506
Minnesota	281,156	288,390	191,220	190,454
Oregon and California	267,235	232,989	200,869	178,841
Massachusetts	49,473	54,510	31,822	34,903
Vermont	31,795	48,554	32,562	46,376
All other States [1]	483,174	558,387	284,313	281,003

[1] 1927—Delaware, District of Columbia, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas, and West Virginia; 1926—Same States, together with Georgia.

TABLE 2

PULPWOOD CONSUMED, BY KINDS OF WOOD: 1927 AND 1926

Kind	Quantity (cords)		Per cent distribution	
	1927	1926	1927	1926
Total	6,659,157	6,766,007	100.0	100.0
Spruce:				
Domestic	2,074,511	2,415,870	31.2	35.7
Imported	944,308	1,013,155	14.2	15.0
Hemlock:				
Domestic	1,146,603	1,064,661	17.2	15.7
Imported	5,048	10,702	0.1	0.2
Yellow pine, Southern	712,610	684,816	10.7	10.1
Poplar:				
Domestic	214,933	212,178	3.2	3.1
Imported	186,695	210,133	2.8	3.1
Balsam fir:				
Domestic	327,663	254,614	4.9	3.8
Imported	84,087	42,500	1.3	0.6
Jack pine	171,131	137,494	2.6	2.0
Yellow poplar	131,113	134,747	2.0	2.0
Beech, birch, and maple	78,311	(1)	1.2	..
White fir	74,628	76,421	1.1	1.1
Gum	64,314	49,801	1.0	0.7
Tamarack or larch	61,114	94,695	0.9	1.4
All other kinds	115,480	183,553	1.7	2.7
Slabs and other mill waste	266,608	180,667	4.0	2.7

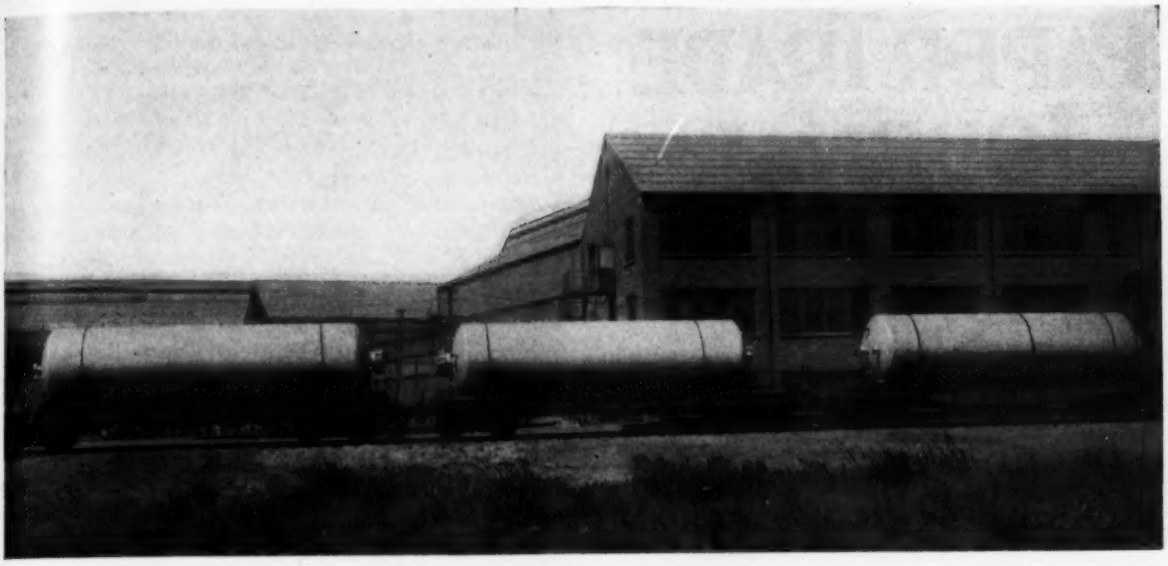
[1] Included in "All other kinds."

[2] 1927—Basswood, cedar, chestnut, cottonwood, Douglas fir, Western yellow pine, and willow; 1926—Basswood, beech, birch, buckeye, cedar, chestnut, cottonwood, Douglas fir, maple, Western yellow pine, white pine, and willow.

Process	Quantity (tons of 2,000 pounds)		Per cent of increase or decrease (—)
	1927	1926	
Total	4,313,403	4,394,766	— 1.9
Ground	1,610,409	1,764,248	— 8.7
Soda fiber	487,478	496,920	— 1.9
Sulphite fiber	1,538,118	1,558,175	— 1.3
Sulphate fiber	617,834	519,960	18.8
Semi-chemical	11,983	(1)	...
Screenings:			
Mechanical	8,229	9,944	—17.2
Chemical	39,352	45,519	—13.5

[1] Not reported.

The Tacoma Electro-Chemical Company's plant now under construction on the Hylebos Waterway, will be ready for operation early in January, according to H. L. Bloomshield, chief engineer.



Kellogg Digesters *on the* Pacific Coast

THE three Kellogg Forge and Hammer Lap Welded Stationary Soda Digesters shown above were installed by the Cascade Paper Company.

These Digesters were built exactly in accordance with the A. S. M. E. Code for Unfired Pressure Vessels, and are good for a working pressure of 125 lb. per square inch. They are 8'0" I.D. x 32'0" long, and have a shell thickness of 13/16". They are complete with charging nozzle, blow nozzle, and all necessary steam and liquor connections.

Among Kellogg installations on the Pacific Coast are the following:

Cascade Paper Company West Tacoma, Wash.	3 Units
National Paper Products Company	3 Units
Crown Williamette Paper Company	3 Units

THE M. W. KELLOGG COMPANY, 225 Broadway, New York

Birmingham, Ala.—827 Brown-Marx Building

Boston—12 Pearl Street *San Francisco*—2929 Harrison St.
Chicago—53 W. Jackson Boulevard *Pittsburgh, Pa.*—Oliver Bldg.
Los Angeles—742 Western Pacific Building

KELLOGG

POWER PLANT PIPING — FORGE WELDED PIPE
FORGE WELDED CONTAINERS—RECEIVERS—SEPARATORS

ALL KELLOGG FORGE AND HAMMER WELDED PRODUCTS ARE INSURABLE

PAPER TRADE JOURNAL
ESTABLISHED 1872

10 East 39th St., New York

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.
Power Engineering Consultant

Member A. B. C. Audit Bureau of Circulations

Vol. LXXXVII New York, Dec. 20, 1928 No. 25

COAL HANDLING IN PAPER MILLS

The discussion in the Power Plant Section of this issue of the PAPER TRADE JOURNAL introduces a topic of very general and pertinent interest to the pulp and paper industries, coal handling and the closely related problem of economical ash disposal. These are considerations which exert much influence upon the cost of steam and power, for unless the raw materials of the power plant, particularly the fuel, are handled at minimum cost, efficiency and economy in the production of power cannot be approached and a severe burden is imposed upon the production costs of the mills.

Many of our pulp and paper making establishments have much still to learn about suitable systems of mechanical equipment for handling coal and ashes, while others have given a good deal of attention to these matters and have developed some very good examples of economical coal handling systems. While this is no uncommon situation among individual industries in general, the great strides made and the wonderful expansion in our fields of pulp and paper making have been so pronounced that our mills should lead in all matters with which they are concerned. Certainly coal handling is one, for few industries burn as much coal as is consumed by our mills.

Part of the reason for our mill power plants not having made greater progress in the development of efficient and economical coal and ash handling systems is, unquestionably, that many of the manufacturers of the mechanical equipment for handling such materials have as yet no real conception of the amount of coal consumed by our mill power plants or of the importance the cost of coal handling assumes in our activities. If the importance of coal handling to the pulp and paper making industries were fully appreciated by these experts, it is very certain that the requirements of our power plants in respect to coal handling equipment would receive by them the study they deserve and that the pulp and paper industries would greatly benefit from such investigations.

To stimulate interest in this direction, discussions dealing with individual installations of coal and ash handling systems, such as that described in this issue, will be presented from time to time, not to be interpreted as recommendations for the system, or systems, featured, but simply as examples of installations which have met with favor in specific mills. For such studies to be of real value, it is necessary that they present cost and operating data, and it is in this connection that the cooperation of all mills which have kept records of their coal and ash handling costs is requested.

If these mills will supply either the manufacturers of the coal handling equipment they employ with such data, or else send the information to the PAPER TRADE JOURNAL, constructive progress in the handling of coal and ashes in the power plants of the paper making industries is assured and they, the mills, will benefit materially.

THE 1928 PAPER CENSUS

The Bureau of the Census has informed the American Paper and Pulp Association that the report forms for the 1928 census of paper production will be distributed late in December in order to reach the mills by the first of January. This census form is extremely simple and merely calls for the tonnage of paper produced and the machine capacity in 1928, so that the manufacturers should have no difficulty in filling them out and returning them to the Bureau by the end of January.

The Bureau of the Census will try to establish a record in collecting and compiling this paper data and with proper cooperation from the paper manufacturers, this census can be completed and published in about two months. Previous census data has been published about one year after the canvass was made and consequently lost a great deal of the value it would have if it could have been published more promptly. The 1928 census has been made as simple as possible so that the manufacturer will be able to fill out the form and return it almost immediately.

This is an opportunity for the paper industry to get the complete annual paper production and capacity figures in record time as the Bureau of the Census will publish the data just as soon as the manufacturers return their reports. The manufacturers are therefore urged to cooperate with the Bureau and fill out and return these census forms just as promptly as possible.

MERRY CHRISTMAS

The merry season of Christmas is here again. We have been reminded of this fact constantly during the past few days by the arrival at this office of many handsome cards and similar tokens from friends in the industry. It would be difficult to acknowledge all of these individually, but they are all very greatly appreciated, and we take this means of expressing our thanks to our friends for their kindness.

The paper industry has experienced an unusually busy year and it is, therefore, fair to assume that paper men, for the most part, at least, are more than usually prosperous. Under the circumstances, this merry season should be more than usually enjoyable for them. That it will prove such, and that the approaching year holds in store for them much additional prosperity is the wish of the PAPER TRADE JOURNAL.

Repairs to several water power sites along the Fox River will be started soon because of the closing of navigation for the season on Saturday of last week. About three inches of ice has formed on the canals, making shipping impossible. The government will spend $65,000 on the locks at Appleton, replacing wooden platforms with concrete. Improving of the breakwater and protective walls at Kimberly, Wis., also will be conducted.

American Foresters Convention Program

Foresters from practically every section of the United States and Canada are to attend the annual meeting of the Society of American Foresters, which will be held in the Main Hall at Teachers College, Columbia University, on December 28 and 29.

At the opening session on Friday morning, December 28, C. M. Butler, president of the society, will address the members on "Battle Fronts of Forestry," and O. M. Butler, of the American Forester Association, will discuss "Industrial Forestry." A report on the "Society Survey of Private Forestry" will be made by Shirley W. Allen, of the University of Michigan. Franklin W. Reed, of the National Lumber Manufacturers Association, will address the meeting on "Some Obstacles to Profitable Industrial Forestry" and Howard L. Churchill, of Finch, Pruyn & Co., Inc., Glens Falls, N. Y., will give an address on "Industrial Forestry in the Adirondacks."

The speakers and their subjects for the afternoon session are as follows: J. C. Boyce, of the Northeastern Forest Experimental Station, Amherst, Mass., "Future of Forest Pests;" Fred Morrell, district forester, Missoula, Mont., "Recent Developments in Fire Protection in the Inland Empire;" Leonidas Coyle, state fire warden, Trenton, N. J., "Basis for Determining Proper Expenditures for Fire Protection;" and Professor A. C. Coonradt, Oregon State Agricultural College, "Steam Generating Apparatus in Forest Areas as Related to Causes of Forest Fire."

Saturday morning's session includes the following addresses: F. W. Besley, State Forester, Baltimore, Md., "Dovetailing State and Federal Acquisition Programs;" Philip W. Ayres, secretary of the Society for the Protection of New Hampshire Forests and E. A. Sherman, associate forester, Washington, D. C., "Denuded vs. Restocked Lands for Acquisition;" A. S. Hopkins, assistant superintendent, Conservation Department Lands and Forests, Albany, N. Y., "Bond Issues for State Forests."

Society affairs will be discussed at the afternoon session, including "Reports on the Proposed Study of Forest Education and the Proposed Creation of Research Fellowships," by R. Y. Stuart, forester, of Washington, D. C.; Topics for General Discussion by the Society. (a) Necessity for Permanent Organization. (b) Proposals for Improvement of Annual Meeting, and (c) What, if anything, ails the *Journal of Forestry?*

The annual dinner of the society will be held on Saturday evening, December 29, at Keen's Chop House, 107 West 44th street, New York. A good dinner and a good time, with Sam Spring as toastmaster, is assured.

Starts Another Storage Dam on Gatineau

The Gatineau Power Company, controlled by Canadian Hydro-Electric Corporation, a subsidiary of the International Paper Company, has begun construction of another storage dam on the Gatineau River in the Province of Quebec. Work will be carried on throughout the winter and it is expected that the dam will be completed and ready for operation next summer.

The new dam, storing the waters of Lake Cabonga, and the present Mercier storage dam will form reservoirs ranking with the large water-storage systems of the world. The two reservoirs will have a combined capacity of 145 billion cubic feet, or one and two-thirds times that of the reservoir created by the famous Assouan dam on the Nile River in Egypt.

Located in the heart of one of the great timberland areas of Canadian International Paper Company, the Cabonga dam will be forty-six miles above the Mercier dam and will form a reservoir of 45 billion cubic feet capacity, draining a territory of 1,150 square miles. The new reservoir will materially assist the Mercier reservoir in regulating the flow of the Gatineau River on which Gatineau Power Company has completed three hydro-electric plants within the past two years.

Two of these stations are within six miles of the City of Ottawa, and have a combined designed capacity of 290,000 horsepower, of which 232,000 horsepower is installed and in the process of installation. The third station, the Paugan plant, thirty-five miles north of Ottawa, has an installed capacity of 204,000 horsepower, and came into operation on October 1 when it commenced delivery of 80,000 horsepower to the Hydro-Electric Power Commission of Ontario. This power is being distributed by the Commission in the Toronto area to supplement the power now supplied from Niagara Falls and is being delivered by Gatineau Power Company under a thirty-year contract, the quantity increasing annually to a maximum of 260,000 horsepower on October 1, 1931, which rate is continued throughout the life of the contract.

Progress in hydro-electric development in Canada has been particularly rapid lately as a result of expanding industrial activities. In this development Gatineau Power Company in a few years has become an important factor and now ranks as one of the largest producers of electric power in the world.

Buys Minneapolis Envelope Plant

[FROM OUR REGULAR CORRESPONDENT]

MINNEAPOLIS, Minn., December 17, 1928.—Negotiations have been completed for purchase of control of the envelope manufacturing division of the Monasch Company by the Berkowitz Envelope Company of Minnesota, a new corporation capitalized for $150,000.

The deal follows closely after the purchase of the lithographing division of the company by Harrison & Smith, Minneapolis lithographers.

Payroll of the company will be increased 50 per cent within the next few months and production of the plant will be more than doubled, Mr. Berkowitz said. New machinery, costing $50,000, will be installed to make the plant one of the most modern in the country.

Output of the plant will average about 1,000,000 envelopes a day, as compared with about 400,000 at the present time.

The Berkowitz interests also operate envelope factories at Kansas City, St. Louis and Des Moines. When the new machinery is installed, the Minneapolis plant will have the same capacity as the St. Louis factory.

L. W. Maddaus, former vice president of the Monasch Company, oldest organization of its kind in Minneapolis, will be connected hereafter with Harrison & Smith. George Monasch will continue as city salesman with the Berkowitz Company.

The company was originally formed in 1871 as Johnson & Smith, but in 1881 it was split and two organizations, the Monasch Company, and Harrison & Smith, were formed. Purchase of the lithographing department by Harrison & Smith again unites the original organization.

The Monasch Company has employed about 50 persons in its envelope manufacturing department. The payroll, under the new management, will be increased to about 75, Mr. Berkowitz said.

To Handle Southern Kraft Division in New York

The kraft paper business of the International Paper Company is expanding so rapidly that on January 1 the company will bring to New York Jacob Seibert, its western representative for this paper, to handle the sales of its Southern kraft division. With a daily capacity of 530 tons of kraft paper and board, the International Paper Company is now the largest manufacturer of this grade of paper in the world. In a little over three years the company has acquired two kraft paper mills in Louisiana and another in Mississippi, has built a fourth mill in Arkansas, is now erecting its fifth kraft paper mill in Alabama, and has decided to build a sixth mill in the Carolinas.

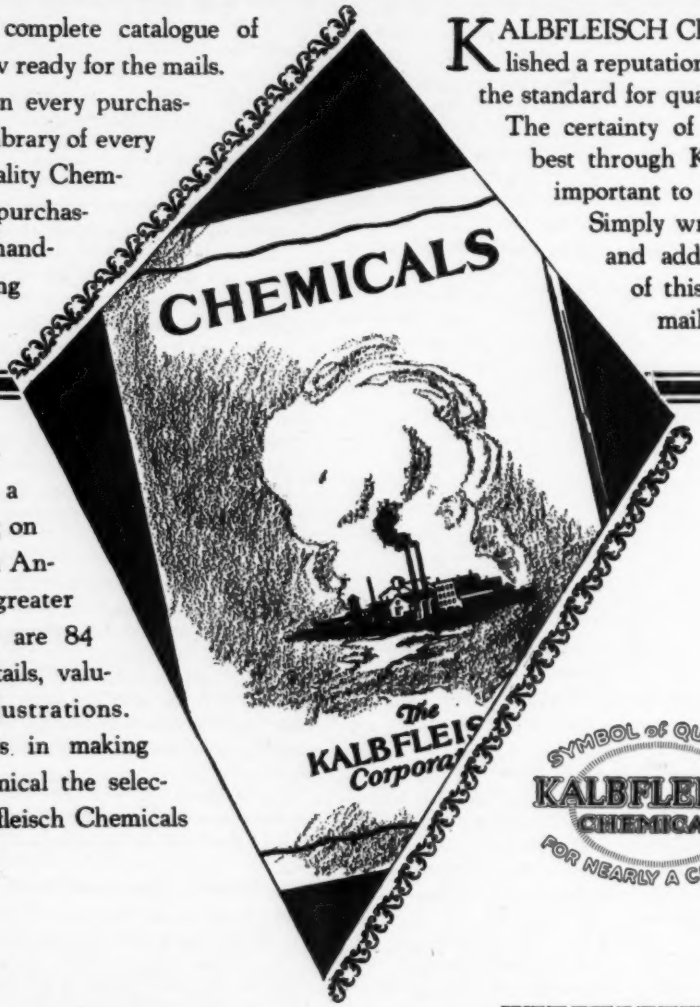
With the exception of one of the Louisiana mills, which was bought in July, 1925, this expansion has occurred in the past twenty months. When its new mills in Alabama and the Carolinas are completed the company will have a daily capacity of about 900 tons of kraft paper and board.

READY Now!

SEND FOR YOUR COPY OF THIS ~ KALBFLEISCH BOOK!

THIS new and complete catalogue of Chemicals is now ready for the mails. A copy should be on every purchasing desk . . . in the library of every industrial user of quality Chemicals. It is a guide to purchasing, a ready reference handbook full of interesting material.

KALBFLEISCH Chemicals have established a reputation which makes them the standard for quality and uniformity. The certainty of receiving only the best through Kalbfleisch makes it important to send for this book. Simply write your name, title and address on the coupon of this advertisement and mail it for your copy.



THIS new catalogue covers a wide scope. Coming on the eve of our 100th Anniversary gives it greater significance. There are 84 pages of helpful details, valuable tables and illustrations. Everything that aids in making practical and economical the selection and use of Kalbfleisch Chemicals is included.

SYMBOL of QUALITY
KALBFLEISCH
CHEMICALS
FOR NEARLY A CENTURY

The KALBFLEISCH Corporation

200 Fifth Avenue, New York, N. Y.

PLANTS:

ERIE, PA. — KALAMAZOO, MICH. — CHATTANOOGA, TENN. — ELIZABETH, N. J. — WATERBURY, CONN. — DE QUINCY, LA.

The Kalbfleisch Corporation
200 Fifth Ave., New York, N. Y.

Gentlemen:

Please send me a copy of the Kalbfleisch Book.

Name ..... Title.....

Address .....

City ..... State.....

Section of the
Technical Association of the Pulp and Paper Industry

AN ORGANIZATION FOR THE ENCOURAGEMENT OF ORIGINAL INVESTIGATION AND RESEARCH WORK IN MILL ENGINEERING AND THE CHEMISTRY OF PAPER, CELLULOSE AND PAPER-MAKING FIBERS GENERALLY; IT AIMS TO PROVIDE MEANS FOR THE INTERCHANGE OF IDEAS AMONG ITS MEMBERS IN ORDER THAT PROCESSES OF MANUFACTURE MAY BE MADE MORE EFFICIENT AND IMPROVED ALONG TECHNICAL LINES.

Edited by
RONALD G. MACDONALD, Secretary

Sawmill Waste for Manufacturing Pulp*

By W. B. Greeley [1]

The use of sawmill waste for the manufacture of pulp, in the Pacific Northwest, has long passed the pioneer stage. It is well developed in the case of spruce and hemlock because of the excellent pulping qualities of these species and their adaptability to all three of the leading processes, that is for groundwood, sulphite, and sulphate pulps.

The use of Douglas fir mill waste is thus far limited to three or four plants manufacturing sulphate pulp and two plants which mix it with other species in the manufacture of soda pulp.

Yield of Pulp Chips Varies Widely

The yields of pulp chips from sawmill waste in current practice vary widely between different mills because of their varying situation and policy in the manufacture of lath, box shook, and like products, in the disposal of slab wood for fuel, and in the production of hog fuel. The actual yields reported under present methods of chip production at hemlock mills range from 1/12 to 5/8 of a unit of 200 cubic feet of chips per thousand board feet log scale of logs manufactured. One experienced operator puts the average yield at one unit of 200 cubic feet for each 4½ thousand feet of logs manufactured at plants which operate lath mills, and at 2 units for each 4½ thousand feet of logs at plants which do not produce lath. The yields from spruce mill waste run somewhat lower because of the relatively close utilization of this species for lumber products.

At one time a great deal of this material was wasted but it is now converted into pulp chips, producing about one unit of 200 cubic feet per thousand board feet of lumber. This form of utilization probably adds from 20 to 25 per cent to the yield of pulping material.

As a general average for the West Coast hemlock mills, it is probable that about 1/3 of a unit of pulp chips is now obtained from each thousand board feet of logs manufactured, through the utilization of mill waste and low grade lumber for this purpose.

An equal yield of pulp chips is probably attainable, on the average, from the conversion of Douglas fir mill waste if all slab wood is utilized for this purpose rather that fuel in one form or another. One plant is now using some cedar in the manufacture of sulphate pulp, and this species may also be regarded as a potential source of raw material for an expanding pulp and paper industry in the Pacific Northwest.

The cut of hemlock and spruce saw timber in the Pacific Northwest, including British Columbia, in 1927 was approximately 2,240,000,000 board feet; while the cut of Douglas fir and cedar saw timber was approximately 10,170,000,000 board feet. At an average yield of 1/3 of a unit of pulp chips from each thousand feet of logs manufactured, we may thus estimate a theoretical supply of raw material for the pulp industry, in the form of mill waste and low grade lumber, of about four million units annually. Accepting the ratio of two units of chips for each ton of manufactured pulp, this raw material would be sufficient, were it actually available for the purpose, to produce about two million tons of pulp annually. Approximately 1/6 of this total would consist of pulps for which spruce and hemlock are adapted; while 5/6 would constitute the pulps for which the utilization of Douglas fir and Red cedar proves feasible.

It will, of course, be readily understood that any such figures on pulp material supplies available from mill waste picture a theoretical maximum, not the quantities of wood actually available to the pulp industry. The geographical location of many sawmills will doubtless exclude them as a practicable source of supply for the pulp industry for at least some time to come; and the wide spread use of mill waste for slab fuel and hog fuel will probably always materially restrict the volume of mill waste economically available for the manufacture of pulp.

Other Economic Factors

Other economic factors have an important bearing upon the limits of cost within which mill waste can be assembled from widely distributed sawmills for the production of pulp. The pulp industry on the West Coast is already utilizing directly large quantities of logs. Five plants in the Columbia River district reported to the West Coast Lumbermen's Association the use of approximately 17,000,000 feet of hemlock, spruce and White fir logs for pulp during the month of August. The use of round cord wood cut from small timber or logging waste is also well established. The economics of raw material supply for the pulp and paper industry in the Pacific Northwest are now in the process of development in these several directions, necessarily controlled by the relative costs of the different classes of material when reduced to pulp chips as well as by the quality of the pulp produced and other factors connected with the particular process or operating program of the individual pulp plants.

I was advised at one Puget Sound sawmill that the conver-

* Presented at the First Pulp and Paper Conference of the Pacific Northwest, at the School of Forestry, University of Washington, October 26, 1928.
[1] Sec.-Mgr., West Coast Lumbermen's Association.

sion of its No. 2 common hemlock lumber into pulp chips is now under consideration. This is a further indication of the many ramifications which the quest of the pulp industry for suitable and economical supplies of raw material will take as its development progresses. In this progression, there will undoubtedly be a further and more complete utilization of sawmill waste for the various grades of pulp, finding its proper place along with the direct converison of logs into pulp chips, of low grade lumber, and of round wood from the logging camps.

Further Technical Development

One of the greatest boons to the forest industries of the West Coast would, and undoubtedly will, be realized in a further technical development of the sulphate and soda pulping processes, and doubtless others as well, so as to afford a wider outlet for the still enormous quantities of unutilized Douglas fir mill waste. With the intensive research now under way, future progress in the manufacture of Kraft pulps from Douglas fir will undoubtedly materialize. From the standpoint of more complete and better correlated use of the forest grown materials available in the Pacific Northwest, this is one of the most important fields for further advance.

A Promising Phase of Progress

It is, of course, an obvious remark that the development of the pulp and paper industry on the northern Pacific Coast is, from all standpoints, a most promising phase of progress in the present utilization and also in the future perpetuation of its forest resources. The pulping industries provide the best solution yet offered for the utilization of mill and logging wastes, not convertible into lumber products, which have hitherto constituted one of the most serious drags upon the efficiency and prosperity of the lumber industry of this region. The progress of forest industries the world over, in financial returns, stability, and opportunity to reproduce their raw materials through the practice of forestry has been coordinate with the degree of utilization of forest grown materials attainable and upon the correlated, or integrated, use of such materials for a variety of commercial products. The more rapidly the forests of the West Coast pass beyond the "one-product" stage of industrial development, the more rapidly will the many problems surrounding the financial success and permanence of the industrial structure based upon these forests be solved.

Increased Return To Timber Owners

Whether the so-called "by-products" of our sawmills and logging camps prove to be more remunerative than their lumber, as has been true in the case of other large industries, or not—the development of the pulp and paper industry cannot fail to increase the returns to the timber owner, logger, and lumber manufacturer and thereby to put greater financial strength and stability into the whole industrial structure. I recently learned of one sawmill, of moderate size, which in 1927 realized nearly $50,000 from the conversion of mill waste into pulp chips and hog fuel, material whose sheer disposal had previously cost a substantial figure.

A Powerful Economic Incentive

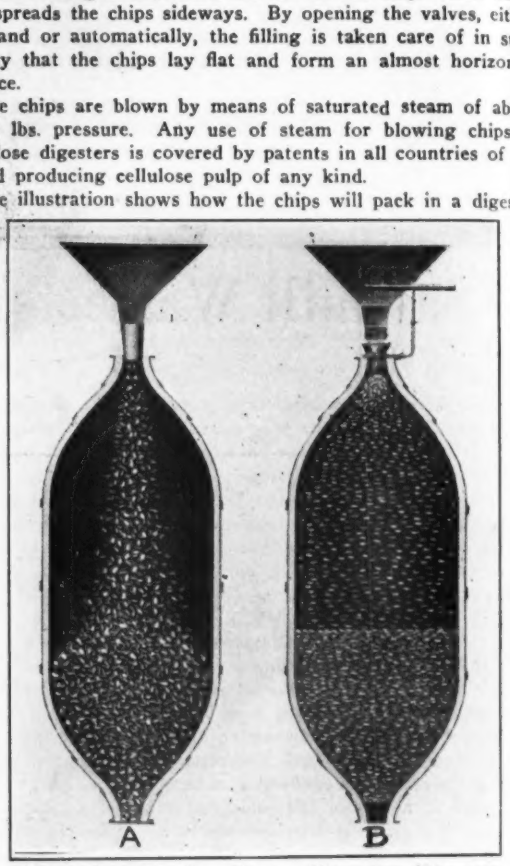
The development of the pulp and paper industry, furthermore, with the capital investments attending it and the interest in permanent supplies of raw material, also promises to create a powerful economic incentive for commercial reforestation in the Pacific Northwest. This region will not be the first where the feasibility of growing stands of pulp wood in relatively short periods has proven the entering wedge for industrial forestry. From this long-time viewpoint, as well as from its immediate contributions to a solution of the industrial problems of the region, the sound development of pulp and paper manufacture is of the greatest promise to all of the interests of the Pacific Northwest identified with its forest resources.

Svensson Chip Filler for Sulphite Digesters

This apparatus consists of two concentric steel pipes connected together with a cross-pipe and each pipe having a separate valve. These two valves are connected by means of intermediate gears in such a way that when closing one valve the other one opens slowly. The steam from the outer pipe effects a straight downward motion of the chip. The other one spreads the chips sideways. By opening the valves, either by hand or automatically, the filling is taken care of in such a way that the chips lay flat and form an almost horizontal surface.

The chips are blown by means of saturated steam of about 60-75 lbs. pressure. Any use of steam for blowing chips in cellulose digesters is covered by patents in all countries of the world producing cellulose pulp of any kind.

The illustration shows how the chips will pack in a digester



Picture Showing Chip Filling With And Without Svensson Chip

—(A) not using the Svensson Chip Filler (B) when using the chip filler.

The results obtained in Sweden, Norway, Finland and other European countries where sulphite and sulphate cellulose is produced are very satisfactory. It is possible to effect a larger or smaller increase in production. One mill in Sweden has obtained an increase of 28%. This is the highest figure reached without having trouble with the circulating in the cooking and the pulp was well cooked and of the highest grade.

The average increase by using the Svensson Chip Filler is 16-20%. The steam used acts in a beneficial way, to some extent loosening up the chips but does not soak the chips with water. There is no loss of steam as the heat obtained is absorbed by the chip.

About 45 European mills are using the Svensson Chip Filler with good results.

Various devices may be used for filling digesters but as mentioned any use of steam for blowing chips into pulp digesters is covered by the Svensson patent in all pulp-producing countries of the world.

Paper Machinery, Ltd., Montreal, P. Q. and the G. D. Jenssen Company, 200 Fifth Ave., New York, are selling the Svensson Chip Distributor.

Chemical Analysis of Pulps and Pulp Woods *

Methods Used at the Forest Products Laboratory

Revised August 1928

Compiled by Mark W. Bray [1]

The following methods of analysis of woods and pulps have been compiled from various sources for the purpose of standardizing, as far as possible, the chemical evaluation of these materials. This compilation is primarily for the use of the Section of Pulp and Paper of the Forest Products Laboratory. It may, however, be of value to others confronted by the same problems. Wherever possible methods standard in the industry have been used, but many of the methods have been modified in the interest either of speed or of accuracy, as experience with them has dictated.

A knowledge of the chemical character of pulp woods and of the chemical changes that the raw material undergoes during the various pulping reactions, or as a result of varying the conditions of treatment, is of considerable importance. It affords a better understanding of the digestion, the bleaching, and the other reactions in pulp preparation and permits a more intelligent control in the subsequent processing of these materials to industrial products.

The degree of wood decay or of hydrolysis accompanying, for instance, the naval stores extraction processes, and the relation of these types of deterioration to the pulping qualities of wood can be predetermined by subjecting such chemically changed raw material to a system of analytical tests.

Application of certain of these analytical tests to pulps often enables one to detect deterioration of the materials used in their manufacture, or deterioration caused by over-cooking, so-called "burning," or subsequent treatments such as bleaching. In addition it is possible to determine the extent of decay in pulps during storage.

A better knowledge of the chemical nature of the various plant fibers used in the making of a given product may uncover properties that will permit substitution of less expensive raw materials, such for example, as the replacement by wood pulp of the more expensive, long-fibered cotton cellulose, now common in many of the other cellulose-using industries.

In using these methods for the chemical examination of wood and wood pulps, it should be borne in mind that they have certain limitations in that complete wood analysis, alone, can not by itself give the specific information necessary for the establishment of the physical utilization of any wood. However, from certain specific determinations together with the data obtained from practical pulping tests, relationships may be derived that may be used statistically in the interpretation of pulping and biological phenomena. Such information enables the investigator to solve his particular problem more satisfactorily.

Preparation of Materials

Method No. 9

Sampling

The sample chosen for chemical analysis must be representative of the material under consideration.

Wood Sample

In the case of wood lengths of approximately one foot are cut from 4 or 8-foot logs. These are again cut lengthwise into quarters. Opposite quarters are sawed radially into small boards ¼ inch to ⅜ inch thick. All of these boards are cut into sawdust with a circular saw provided with a grinder arranged to cut just the width of the saw[2]. The sawdust drops into a box, which fits tightly against the iron framework of the saw. The sawdust is then ground in a disc-mill until it passes a 60-mesh standard sieve (60 meshes to the inch). The portion remaining on an 80-mesh sieve is retained for analysis, while the portion passing the 80-mesh sieve is rejected.

Pulp wood chips, as obtained from a wood chipper, are ground in the disc-mill in the same manner as the finer sawdust is handled, except that the discs are set father apart so as to accomodate the larger sized material. After passing the chips through the mill several times, the material is finally reduced to the same degree of fineness as the sawdust.

A power sifter should be used in order to secure a better separation of the very finely divided material, which clings tenaciously to the coarser particles, than can be done by shaking the sieves by hand. The air-dry sample is kept in a sealed Mason jar, so that the moisture content is maintained approximately constant during the course of the anaylsis.

Pulp Sample

The air-dry pulps are shredded to a fine, fluffy condition, either by means of a "hammer and squirrel cage" shredder or an enclosed circular wire brush. In the brush method, the wires on the brush against which the pulp strips are held are approximately ¼ inch long. The brush method yields a finer and more uniform sample. The shredded material is also stored in sealed Mason jars. At least 60 grams of material are required for a complete analysis.

If the sample of pulp represents very raw or partially-cooked material in softened chip form, it should be ground in the disc-mill and treated in the same manner as described for wood.

Analytical Procedure

All results except percentage of moisture are calculated and reported on the basis of oven-dry weight of material. The metric system is used throughout these methods, namely, all weights are in grams and volumes in cubic centimeters..

Moisture

Method No. 11

Gravimetric

Two to four grams of air-dry material is weighed in a glass-stoppered weighing bottle and is dried to constant weight in an air oven at 105° C., which usually requires from 3 to 4 hours. The weighing bottle, containing the sample, is then closed, cooled in a desiccator over concentrated sulphuric acid, and weighed. Dry pulp is very hygroscopic and should therefore always be cooled and weighed in a closed vessel.

The percentage of moisture in the material is calculated by means of the following formula:

$$\frac{\text{Weight of moist sample} - \text{Weight of oven-dry material}}{\text{Weight of moist sample}} \times 100 = \text{Percentage of moisture in the material}$$

Xylene Volumetric

Method No. 13

When essential oils or other volatile substances are present the moisture or water content of the wood may be determined according to the method developed by Schwalbe[3]. Approximately 25 grams of the sawdust is placed in a 500 cc. distilling flask and covered with water-saturated xylene. The water and

[1] Member TAPPI; Chemist in Forest Products U. S. Forest Products Laboratory, Wausau, Wis.

[2] For illustration see A. W. Schorger, Ind. Eng. Chem. 9, 556 (1917).

* Presented at Fall Meeting of TAPPI, Wausau, Wis., Sept. 25, 1928.

[3] C. J. Schwalbe. Z. Angew. Chem. 21, 400 (1909).

xylene distill over together and the distillate, cooled by passing through a water condenser, is collected in a graduated tube provided with a funnel.

The distillate separates into two layers, the lower of which consists of water. The amount of water may be read off directly, since the essential oil is soluble in the xylene[4].

$$\frac{\text{Volume of weight of water}}{\text{Weight of moist sample}} \times 100 = \text{Percentage of moisture in the material}$$

Should the subsequent analyses of the wood be made on air-dry material, the results may be calculated and reported on the oven-dry basis.

Ash[2,5]

Method No. 66

Three grams of oven-dry wood or pulp are incinerated in a shallow, tared, platinum dish in an electric muffle at a dull red heat. The contents of the dish are stirred occasionally, if necessary, with a stiff platinum or nichrome wire to insure complete combustion of the carbon.

If the combustion is incomplete the carbon will appear as a black suspended material on treatment with dilute hydrochloric acid. The ash is cooled in a desiccator over concentrated sulphuric acid and is weighed. The amount of ash is reported as a percentage of the oven-dry material. The percentage of ash in the sample is calculated as follows:

$$\frac{\text{Weight of ash}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of ash}$$

Cold-Water Solubility[6,7]

Method No. 15

Two grams of air-dry material, the moisture content of which has been previously determined, or of oven-dry sawdust or pulp is placed in a 400 cc. beaker, and covered with 300 cc. of distilled water. This mixture is allowed to digest at room temperature, with frequent stirring, for 48 hours. The material is transferred to a tared alundum crucible, is washed with cold distilled water and is dried to constant weight at 105° C. in an air oven. Drying usually requires approximately 4 hours. The crucible is placed in a stoppered weighing bottle, is cooled in a desiccator over concentrated sulphuric acid, and is weighed. From the loss in weight caused by extraction, the percentage of material soluble in cold water may be calculated as follows:

$$\frac{\text{Oven-dry weight of sample} - \text{Oven-dry weight of extracted material}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of cold water soluble material}$$

Hot-Water Solubility[6,7]

Method No. 17

Two grams of air-dry material, the moisture content of which has been previously determined, or of oven-dry sawdust or pulp, is digested with 100 cc. of distilled water in a 200 cc. Erlenmeyer flask provided with a reflux condenser. The flask is placed in a boiling water bath, the water level of which is maintained constant, just above the solution in the Erlenmeyer flask, by means of a constant-level apparatus, The constant-level apparatus consists of a 3 to 5 liter balloon flask inverted above the water bath. Connection is made between the balloon flask and the water bath by means of glass tubing,

After the water in the bath has boiled gently for three hours, the contents of the Erlenmeyer flask are transferred to a tared alundum crucible, are washed with hot water, are dried, are cooled over concentrated H_2SO_4 and are weighed in a stoppered weighing bottle.

The percentage is calculated from the loss in weight resulting from extraction.

$$\frac{\text{Oven-dry weight of sample} - \text{Oven-dry weight of extracted material}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of material soluble in hot water}$$

Alkali Solubility[6,8]—1 Per Cent NaOH

Method No. 19

Two grams of air-dry material, the moisture content of which has been previously determined, or of oven-dry wood or pulp is placed in a 250 cc. beaker to which is added 100 cc. of one per cent sodium hydroxide solution[8]. The beaker is covered with a watch glass and is placed in a bath of boiling distilled water for exactly one hour. The height of the water in the bath is maintained level with the solution in the beaker by means of a constant-level flask. The contents of the beaker are occasionally stirred with a glass rod. The insoluble material is then collected in a tared alundum crucible, is thoroughly washed successively with hot distilled water, dilute acetic acid (approximately 10 per cent by weight), and hot water, is dried to constant weight in an air oven at 105° C., is cooled in a stoppered weighing bottle placed in a desiccator over concentrated H_2SO_4, and is weighed. The difference in the oven-dry weight of the sample and that of the oven-dry insoluble material is the portion soluble in alkali.

The percentage of material soluble in 1 per cent sodium hydroxide solution is calculated as follows:

$$\frac{\text{Oven-dry weight of sample} - \text{Oven-dry weight of insoluble material}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of 1 Per cent NaOH soluble material}$$

Alkali-Solubility Corrected for Water-Solubility

Method No. 21

The value for the alkali-solubility corrected for water-solubility is obtained by subtracting the percentage of hot water soluble material from that of the 1 per cent alkali soluble material. This correction is made under the assumption that all of the material soluble in hot water is also soluble in 1 per cent sodium hydroxide solution.

Ten Per Cent Potassium Hydroxide Solubility[9]

Method No. 23

The material soluble in potassium hydroxide solution is determined by treating two grams of pulp or sawdust which has been previously dried at 105° C., and placed in a 250 cc. Erlenmeyer flask provided with a reflux air condenser with 100 cc. of 10.0 (±0.1) per cent caustic potash solution. The flask and contents are heated for three hours in a salt-water (NaCl) bath maintained at 100° C. An equivalent strength of sodium hydroxide solution, namely, 7.14 (±0.1) per cent may be substituted for the 10.0 per cent potassium hydroxide solution.

Care must be taken to avoid concentration of the sodium hydroxide solution or undue oxidation of the pulp, caused by the exposure of the alkali-soaked material to the air. After the heating is completed the material and the solution are poured into a beaker containing 1 liter of distilled water, and the alkali is neutralized with a decided excess of glacial acetic acid, which causes the precipitation of some of the beta-cellulose. The undissolved material together with the precipitated beta-cellulose are then filtered out using a weighed alundum crucible, and are thoroughly washed successively with hot water, alcohol and ether. The washed material is then dried to constant weight at 105° C., which usually requires about 3½ hours, and is weighed in a

[4] Forest Service Circular 134.
[5] Schwalbe and Sieber. Betriebs-Kontrolle in der Zellstoff und Papier Industrie.
[6] A. W. Schorger, "Chemistry of Cellulose and Wood." (1926).
[7] L. F. Hawley and L. E. Wise, "Chemistry of Wood." (1926).
[8] The strength of the sodium hydroxide in the solution is determined by titration with standard acid using phenol-phthalein and methyl orange, successively, as indicators.
[9] Pamphlet No. 450, Ordnance Dept., U. S. A., p. 16 (1918).

stoppered weighing bottle. The loss in weight is then calculated as the per cent "KOH soluble" content, using the same formula as reported for the determination of 1 per cent alkali solubility.

Ether Solubility [6,7]
Method No. 25

The ether soluble content is a measure of the waxes, fats, resins, and similar material. Approximately two grams of the sawdust or shredded pulp is weighed in a tared alundum crucible (porosity R. A. 98) and placed in a stoppered weighing bottle. The crucible containing the material is placed with the bottle in an oven and dried to constant weight at 105° C., which requires approximately 2 hours. The crucible is placed in the stoppered bottle, is cooled in a desiccator over concentrated H_2SO_4 and is weighed as oven-dry material. The crucible is removed from the bottle and is placed in a Soxhlet apparatus, where the sawdust is extracted with chemically pure ethyl ether for 3 to 4 hours, is dried at 105° C., is cooled, and is weighed. The amount of material extracted may be determined either by weighing the extracted residue after evaporation of the solvent or by determining the loss in weight of sawdust resulting from extraction.

The percentage of material soluble in ether is calculated as follows:

$$\frac{\text{Oven-dry weight of ether extract}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of ether soluble material}$$

The results obtained in the two procedures do not always exactly correspond, and the former is recommended as the more accurate method. The difference in the results obtained by the two methods is probably due to three factors, namely, (1) some of the extracted substances volatilize during drying[8]; (2) some of the solvent remains included within the extracted substances and is difficult to remove entirely during the evaporation procedure[8]; (3) some of the sample is lost as a result of spattering during extraction. The ether-extracted residue is used for the determination of lignin.

Lignin [6,7]
Method No. 31

The lignin[10] or non-carbohydrate content of wood substance or pulp is obtained by a modification of the method of Ost and Wilkening[11] employed for the hydrolysis of cellulose.

Approximately two grams of air-dry wood, sawdust, or shredded pulp is weighed into a tared alundum crucible (proposity R. A. 98) contained in a glass-stoppered weighing bottle. The crucible and its contents are dried to constant weight at 105° C., are cooled, and are weighed. The material is then extracted with ether in a Soxhlet apparatus for 3 to 4 hours as described under the ether-solubility determination. Because of the small amounts of extractives in pulps, the extraction operation may usually be dispensed with and the samples may be weighed and dried in weighing bottles directly. The dried material is transferred from the crucibles to weighing bottles, is divided into fine particles, and is treated with 40 cc. of 72.0 (±0.1)[12] per cent by weight sulphuric acid, the strength of which has previously been determined by titration with a standard sodium hydroxide solution. The hydrolysis is allowed to proceed for 16 hours at room temperature, with frequent stirring and thorough mixing of the acid with the sample at the beginning of the operation. The resulting solution is transferred to a 2-liter Erlenmeyer flask and is diluted to 1570 cc. with distilled water, which makes the concentration of H_2SO_4 exactly three per cent, is covered with a watch glass, and is boiled for two hours; distilled water is added from time to time to keep the volume constant. The suspended particles of lignin are then filtered on the tared alundum crucible used in the beginning of the determination, are washed thoroughly with hot distilled water (500 cc.), are dried to constant weight at 105° C., which usually requires about 2-½ hours, are cooled in a desiccator, and are weighed as lignin. The crucible and contents are placed in a tared, stoppered weighing bottle while cooling in the desiccator.

The percentage of lignin in the sample is calculated as follows:

$$\frac{\text{Oven-dry weight of lignin}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of lignin}$$

Alcohol-Benzene Solubility
Method No. 27

In addition to the substances removed by ethyl ether, possibly some of the so-called wood gums are dissolved by extraction with a mixture of 33 per cent alcohol and 67 per cent benzene.

Approximately two grams of air-dry wood, sawdust, or pulp is weighed in a tared alundum crucible contained in a weighing bottle. The crucible is placed in an oven along-side the weighing bottle and is dried to constant weight at 105° C., which usually requires 3 hours. It is again placed in the stoppered weighing bottle, is cooled in a desiccator over concentrated sulphuric acid, and is reweighed.

The crucible with its contents is extracted 4 to 6 hours in a Soxhlet extractor with the alcohol-benzene mixture described in the preceding paragraph. After evaporation of the solvent the sample is again dried to constant weight at 105° C. The percentage of extracted material may be determined either from the loss in weight of the sample or from the weight of the extract after evaporation of the solvent in the drying oven.

The percentage of material soluble in alcohol-benzene mixture is calculated as follows:

$$\frac{\text{Oven-dry weight of alcohol-benzene extract}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of alcohol-benzene soluble material}$$

Cellulose

Cross and Bevan[13] in 1880 announced that lignocelluloses when treated first with dilute NaOH solution and then with chlorine gas and dilute sodium sulphite solution yielded a white product resembling cotton cellulose. This procedure is the basis of the most reliable method for the determination of cellulose at the present time.

It has been shown[1] that higher yields of cellulose were obtained by omitting the initial treatment of the wood with one per cent sodium hydroxide solution.

In the original methods[1, 13] the chlorination treatments were long; ranging from 30 minutes for the first chlorination to 15 minutes for the last.

Ritter[14] has shown that these chlorination periods may be shortened to three minutes for the first chlorination and that even in this short period the same quantities of lignin and substances other than cellulose are removed. The cellulose thus isolated is in as pure form as when treated with chlorine gas for the longer periods.

Roe[15] has described a method for the determination of the chlorine absorbed by unbleached sulphite pulps.

Dore[16] chlorinated his samples directly in a crucible, and devised a special apparatus for that purpose.

By the application of the principles of the last two months to the modified methods of Schorger and of Ritter for cellulose estimation in wood and wood pulps, it is possible to determine in addition to cellulose the amount of chlorine required for the isolation of the cellulose. The data thus obtained, especially

[10] P. Klason, Paper Industry 4, 262 (May, 1922).
[11] Cross and Bevan, "Researches on Cellulose, III," p. 39 (1905-10); Chemiker Zeit. 34, 461 (1910).
[12] E. Becker, Papier Fabr. 17, 1325 (1919). P. Klason, Svensk. Pap. Tid. 19, 129 (1916).
[13] Cross and Bevan, J. Chem. Soc. 38, 666A (1880). Chem. News 42, 77-91 (1880). J. Chem. Soc. 55, 199 (1889).
[14] G. J. Ritter, Ind. Eng. Chem. 16, 947 (1924).
[15] R. B. Roe, Ind. Eng. Chem. 16, 808 (1924).
[16] W. H. Dore, Ind. Eng. Chem. 12, 264 (1920).

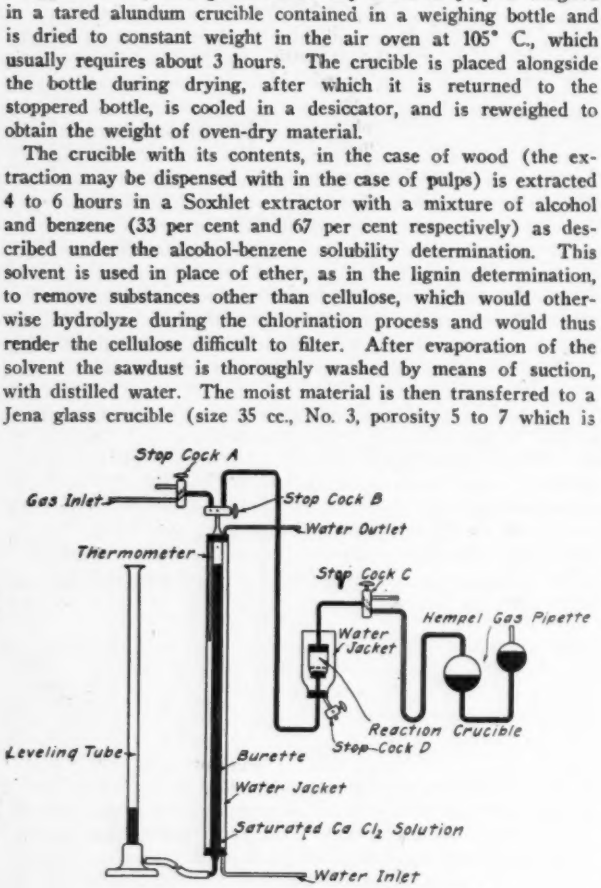
in the case of pulps, furnish an indication of their relative bleachabilities.

Method of Estimation

Method No. 33

Approximately two grams of air-dry wood or pulp is weighed in a tared alundum crucible contained in a weighing bottle and is dried to constant weight in the air oven at 105° C., which usually requires about 3 hours. The crucible is placed alongside the bottle during drying, after which it is returned to the stoppered bottle, is cooled in a desiccator, and is reweighed to obtain the weight of oven-dry material.

The crucible with its contents, in the case of wood (the extraction may be dispensed with in the case of pulps) is extracted 4 to 6 hours in a Soxhlet extractor with a mixture of alcohol and benzene (33 per cent and 67 per cent respectively) as described under the alcohol-benzene solubility determination. This solvent is used in place of ether, as in the lignin determination, to remove substances other than cellulose, which would otherwise hydrolyze during the chlorination process and would thus render the cellulose difficult to filter. After evaporation of the solvent the sawdust is thoroughly washed by means of suction, with distilled water. The moist material is then transferred to a Jena glass crucible (size 35 cc., No. 3, porosity 5 to 7 which is



Apparatus for the Determination of Chlorine Absorption in the Isolation of Cellulose

Fig. 1

equipped with a fritted glass bottom. Suction is applied first at the bottom of the crucible until the excess moisture is removed, and then at the top. The suction at the top removes the water from the fritted glass plate and distributes the remaining moisture evenly throughout the entire sample. The crucible is water jacketed and is connected between the gas burette and the Hempel gas pipette of the chlorination apparatus[17] as shown in Fig. 1, by means of two rubber stoppers through which pass capillary glass tubing. A measured quantity of chlorine gas is forced from the burette up through the material in the crucible and over into the Hempel gas pipette as rapidly as possible. During the first chlorination, samples of wood absorb approximately 230 cc. of chlorine gas at room temperature and atmospheric pressure; this necessitates refilling the burette, which may be done quickly since it is connected to a chlorine tank with a 3-way stop cock. The first chlorination treatment requires from three to four minutes, after which the crucible is removed from the apparatus and the material is washed with cold, distilled water, using suction. These washings are saved for subsequent determination of the HCl formed. The material is next washed successively with 50 cc. each of a 3 per cent sulphurous acid solution, cold water, and a freshly prepared 2 per cent sodium sulphite solution. The material is transferred to a 250 cc. Pyrex beaker with the aid of a pointed glass rod, and is treated with 100 cc. of a 2 per cent solution of sodium sulphite. The last traces of the sample adhering to the porous bottom of the crucible are removed by successively drawing 10 cc. portions of the sodium sulphite solution up through the bottom of the crucible by means of suction. A rubber policeman drawn gently over the bottom of the crucible assists materially in loosening particles of the sample during this procedure. The beaker containing the sample is covered with a watch glass and is placed in a boiling waterbath for 30 minutes. The fibers are again transferred to the glass crucible and are washed with about 250 cc. of distilled water. This procedure is never sufficient to remove all the lignin so that the treatment with chlorine and subsequent treatments as just outlined are repeated until the fibers are practically a uniform white or at least show only a very faint tinge of pink upon addition of the sodium sulphite solution. The second and following treatments with chlorine should not require more than 1 or 2 minutes[18] each.

After all of the lignin has been removed, the fibers are thoroughly washed in an alundum crucible (porosity R. A. 98) successively with hot water, 10 per cent acetic acid, 500 cc. hot water, 50 cc. of 95 per cent alcohol and finally with 50 cc. of ether. The tared crucible and its contents are dried at 105° C., to constant weight in an air oven, which usually requires about 2½ hours.

The tared alundum crucible and its contents are again placed in the original stoppered weighing bottle, are cooled in a desiccator over concentrated sulphuric acid, and are weighed.

The percentage of cellulose in the sample is calculated as follows:

$$\frac{\text{Oven-dry weight of cellulose}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of cellulose}$$

Chlorine Consumption

Method No. 35

The chlorine consumption of wood or pulp is the total amount of chlorine gas required in the isolation of the cellulose. In the case of pulps, this figure furnishes values indicating their relative bleachabilities. The percentage of chlorine consumed is obtained from the sum of all the volumes used in the several chlorination treatments corrected to 0° C. and 760 mm. pressure, according to the following formula:

$$V_0 = \frac{V_t \times p - a}{760\,(1 + 0.00367t)}$$

Where V_0 is the volume of chlorine gas under standard conditions; a is the vapor pressure of chlorine gas over calcium chloride[19] solution saturated with chlorine gas at some temperature, t, of chlorination; V_t is the volume of chlorine gas at chlorination temperature t; p is the barometric pressure in mm. mercury. Table 1 furnishes data for making the calculations according to the formula just given.

TABLE 1
CONSTANTS FOR CHLORINE CONSUMPTION

t °C.	a	760 × (1 + 0.00367t)
24.5	17.3	828.36
25.0	18.0	829.76
26.0	19.4	832.57
27.0	20.8	835.40
28.0	22.0	838.12
29.0	23.5	840.96
30.0	25.0	843.66
31.0	26.4	846.48
32.0	29.0	849.30

The weight of 1 cc. of chlorine gas at standard temperature and pressure is 0.0031675 gm.

[17] The Roe apparatus consists of a water jacketed gas burette, a chlorination chamber, and a Hempel gas pipette used as a reservoir.

[18] Prolonged action of chlorine gas, together with the hydrochloric acid formed in the secondary reactions, hydrolyzes the cellulose, gives low yields, and causes varying amounts of alpha-cellulose. Bray and Andrews, Paper Trade J. 76, No. 8, 47 (Feb. 22, 1923).

[19] Calcium chloride solution for gas burette and Hempel gas pipette: Saturate a solution with calcium chloride at room temperature and bubble chlorine gas in until it is saturated and filter for use. When the apparatus is not in service it is well to have it filled with fresh chlorine gas, thus keeping the calcium chloride solution saturated with chlorine.

The percentage of chlorine consumed may be obtained by substitution of the proper values in the following formula:

$$\frac{V_o \times 0.0031675}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage chlorine consumed}$$

Alpha-, Beta-, and Gamma-Celluloses

The determination of the alpha-, beta-, and gamma-celluloses [20] in celluloses obtained from wood by the chlorination method, or directly on pulps, is a measure of the resistance of the cellulose or pulp to the action of 17.5 (±0.2) per cent sodium hydroxide solution, which is known as Mercer's solution. In cases where the alpha-cellulose content of a cellulose or a lignin-free pulp [21] alone is desired, or when the alpha-cellulose is not difficult to filter and wash, the gravimetric method may be used. When data on all three constituents are desired, however, the work may be facilitated by using the volumetric method [22].

Gravimetric Method for the Determination of Alpha-Cellulose

Method No. 37

One gram of oven-dry cellulose, obtained by the previously described chlorination method, or of pulp is weighed into a beaker and is triturated with 25 cc. of mercerizing liquid (17.5 per cent sodium hydroxide solution) [23] until the mass is homogeneous, and is then allowed to stand for 30 minutes. The contents of the beaker are filtered by the aid of suction through either a tared alundum crucible (porosity R. A. 98), a Gooch crucible, or a fritted-glass Jena crucible (No. 3 porosity 5 to 7). After the insoluble cellulose or alpha-cellulose is sucked practically dry, it is loosened with a glass rod and is first washed with 4 per cent sodium hydroxide solution (50 cc.) and then with approximately 300 cc. of cold distilled water. The alpha-cellulose is next treated with approximately 75 cc. hot dilute (10 per cent) acetic acid, again washed with hot distilled water (300 cc.), dried to constant weight at 105° C., cooled in a desiccator, and weighed as alpha-cellulose.

$$\frac{\text{Oven-dry weight of alpha-cellulose}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of alpha-cellulose}$$

Volumetric Methods for the Determination of Alpha-, Beta-, and Gamma-Celluloses

Method No. 38

Since, in the volumetric method, the alpha-cellulose after isolation is dissolved in 72 per cent (by weight) sulphuric acid and is determined by titration, it is not necessary to wash it free from sodium hydroxide. Removal of the last traces of sodium hydroxide from the alpha-cellulose is very difficult when the original cellulose contains a high percentage of beta-cellulose, since this renders the alpha-cellulose difficult to wash. In some cases, especially when large amounts of beat-cellulose are present, it is impossible to separate the alkali-insoluble and alkali-soluble cellulose (alpha- and beta-cellulose) by filtration through an alundum crucible as the cellulose mass becomes very jelly-like. In such cases, the alkali-treated cellulose is placed in tubes and centrifuged until the alpha-cellulose separates at the bottom of the tube. The supernatant liquid is decanted from the alpha-cellulose and the latter is successively washed by decantation and centrifuging first with 4 per cent sodium hydroxide solution (50 cc.) and then with distilled water the total washings amount to approximately 350 cc.

The Volumetric [24] Method for the Determination of Alpha-Cellulose

One gram of oven-dry pulp or of cellulose, obtained by the method described for the estimation of cellulose, is triturated for 30 minutes with 25 cc. of 17.5 per cent sodium hydroxide solution as described in the gravimetric method for the determination of alpha-cellulose. The alkaline solution is separated from the alpha-cellulose by filtration either through an alundum, Gooch, or Jena fritted glass crucible using suction, or by the centrifuging procedure just described. The alpha-cellulose is then loosened with a glass rod and is washed with a 4 per cent sodium hydroxide solution and then with approximately 300 cc. of cold distilled water added in small quantities. The alkali insoluble or alpha-cellulose is removed from the alundum crucible with a pointed glass rod and is placed in a 250 cc. beaker. The filtrate is used for the determination of beta- and gamma-celluloses. The alpha-cellulose is dissolved in approximately 30 cc. of 72 per cent (by weight) sulphuric acid, is transferred to a 100 cc. graduated flask by washing successively with portions of the acid, and is filled with acid to the graduation mark. A 10 cc. sample is pipetted into a 250 cc. pyrex beaker, to which is added 10 cc. of standard dichromate solution and approximately 60 cc. of a solution not stronger than 72 per cent (by weight) of sulphuric acid. The oxidizing mixture is boiled gently for exactly five minutes, is cooled in ice, and the excess dichromate is titrated with ferrous ammonium sulphate solution as described in the section under the standardization of the potassium dichromate solution.

The percentage of alpha-cellulose in the oven-dry sample of cellulose or pulp is calculated as follows:

$$\frac{10 \times \frac{x-y}{x} \times 10 \times Z}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of alpha-cellulose,}$$

where x is the volume in cubic centimeters of Mohr's salt ($Fe(NH_4)_2(SO_4)_2.6H_2O$) solution equivalent to 10 cc. of potassium dichromate solution; y is the volume in cc. of Mohr's salt solution used in back titration of a 10 cc. aliquot part or one-tenth of the original solution of alpha-cellulose dissolved in 72 per cent of H_2SO_4; Z is the weight in grams of cellulose oxidized with 1cc. $K_2Cr_2O_7$ solution. (See section on standard solutions.)

The Determination of Beta- plus Gamma-Cellulose

The 350 cc. alkaline filtrate containing the beta- and gamma-cellulose, remaining from the insoluble or alpha-cellulose determination, is diluted to exactly 400 cc. This solution is divided into two equal parts. One 200 cc. portion, which is left alkaline, is diluted to 250 cc. in a graduated flask and is used for the determination of the beta- plus gamma-celluloses. A 25 cc. portion of this solution is pipetted into a 250 cc. beaker. To it is added 5 cc. of the standard dichromate solution and 60 cc. of 72 per cent (by weight) sulphuric acid. The contents of the beaker are boiled for exactly five minutes, are cooled in ice, and are titrated as described under the alpha-cellulose determination. From this titration the sum of the percentages of the beta- and gamma-celluloses is calculated as follows:

$$\frac{5 \times \frac{B-A}{B} \times 20 \times Z}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of beta- plus gamma celluloses,}$$

where B is $\frac{x}{2}$ or cc. of Mohr's salt solution equivalent to 5 cc.

[20] Cross and Bevan, "Researches on Cellulose," III (1905-10), p. 23; "Paper Making" (1916), p. 97; Schwalbe, "Chemie der Cellulose" (1911), p. 637; Jentgen, Kunststoffe 1, 165 (1911); Mag. Jahr. 57, 426 (1911); Z. angew. Chem. 24, 1341 (1911); Opfermann, "Die Chemische Untersuchung Pflanzliche Rohstoffe und der daraus abschiedenen Zellstoffe," translated by C. J. West, Paper 8, 19 (1921); Bronnert, "Die Chem. Unter., etc.," Berlin (1920); Schwalbe and Sieber, "Die Chemische Betriebs-Kontrolle in der Zellstoffe und Papier Industrie," p. 151; Bray and Andrews, Ind. Eng. Chem. 15, 377 (1923); Cellulose Chemie 4, 115 (1923); Zelistoff und Papier 3, 109 (1923); Paper Makers Monthly J., London, 61, 5 (1923); Sherrard and Blanco, Ind. Eng. Chem. 14, 64 (1922); Th. Bentzen, Paper Trade J. 83, No. 22, 48 (1926).

[21] A small amount of lignin impurity, remaining in the pulp, is not separated from the alpha-cellulose in the gravimetric method and an error is introduced by its presence.

[22] Bray and Andrews, Ind. Eng. Chem. 15, 377 (1923); Paper Trade J. 77, No. 8, 51 (Aug. 23, 1923).

[23] Add 825 cc. of distilled water to 175 grams of C.P. sodium hydroxide; cool and titrate a sample with normal sulphuric acid to methyl orange and phenolphthalein end points. In this manner the solution may be adjusted so that the actual NaOH content is 17.5 per cent.

of the $K_2Cr_2O_7$ solution; A is the cc. of Mohr's salt solution used in the back titration of one-tenth of the alkaline solution of beta- and gamma-cellulose.

The Determination of Gamma-Cellulose

The remaining 200 cc. of the alkaline filtrate from the alpha-cellulose determination is acidified with a 10 per cent sulphuric acid solution using one drop of dilute methyl orange as an indicator, adding 5 cc. of this acid in excess and diluting to 250 cc. in a graduated flask. This procedure almost immediately precipitates the beta-cellulose. The flask is allowed to stand several hours, until the beta-cellulose coagulates and settles to the bottom. A 25 cc. portion of the supernatant liquid is pipetted from the flask and is treated as described under the determination of beta- plus gamma-celluloses. From this determination the percentage of gamma- or soluble cellulose is calculated as follows.

$$\frac{5 \times \frac{B-G}{B} \times 20 \times Z}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of gamma-cellulose,}$$

where B is $\frac{x}{2}$ or cc. of Mohr's salt solution equivalent to 5 cc. of the $K_2Cr_2O_7$ solution; G is the cc. of Mohr's salt solution used in back titration of gamma-cellulose.

The Determination of Beta-Cellulose

The percentage of beta-cellulose is obtained by subtracting the percentage of gamma-cellulose from that of the beta- plus gamma-celluloses.

Standard Solutions for the Volumetric Determination of the Celluloses

Theoretically, cellulose is decomposed upon oxidation with potassium dichromate in sulphuric acid solution as follows:

$$C_6H_{10}O_5 + 6\,O_2 \rightarrow 6\,CO_2 + 5\,H_2O.$$

Ninety grams of chemically pure potassium dichromate are dissolved in 1 liter of distilled water.

One hundred fifty-nine and nine-tenths grams of chemically pure ferrous ammonium sulphate (Mohr's salt) are made up to 1 liter with distilled water, containing 10 cc. of 10 per cent (by weight) sulphuric acid to prevent hydrolysis and avoid the separation of the basic salts.

The potassium dichromate solution is standardized against either Cross and Bevan cellulose obtained from wood pulp, or cotton.

Approximately one gram of cellulose (not corrected for ash) dried to constant weight at 105° C. is taken from a weighing bottle and placed in a 250 cc.. beaker. This is triturated with 30 cc. of 72 per cent (by weight) sulphuric acid and allowed to stand until solution is complete. The sulphuric acid solution is transferred to a 100 cc. graduated flask. The beaker is washed several times with 72 per cent sulphuric acid to insure complete removal of the dissolved cellulose. The flask is filled to the graduation mark with 72 per cent sulphuric acid and the contents are thoroughly mixed. To a 10 cc. portion of the dissolved cellulose pipetted into a 250 cc. beaker, 10 cc. of potassium dichromate solution and approximately 60 cc. of 72 per cent (by weight) sulphuric acid are added. The solution in the beaker is boiled for exactly five minutes, is cooled in ice, and is titrated with ferrous ammonium sulphate solution using potassium ferricyanide as he indicator. The titration is conducted in the usual way and the point where a drop of the titrated solution gives a blue color with a drop of the indicator is taken as the end point of the titration. The relative value of the ferrous ammonium sulphate solution to the dichromate solution is established by titrating a 10 cc. portion of potassium dichromate solution with ferrous ammonium sulphate solution, using potassium ferricyanide as the indicator. From these values the cellulose equivalent of the dichromate solution is calculated as follows:

$$\frac{\text{Weight of cellulose taken}}{\text{cc. } K_2Cr_2O_7 \text{ used in oxidation}} = \frac{\text{Grams cellulose per cc.}}{\text{of } K_2Cr_2O_7 \text{ solution}} = Z$$

Copper Number [24]

The "copper number" of cellulose and pulps is the amount of copper in grams reduced from the cupric to the cuprous state by 100 grams of the oven-dry material. It is regarded as a measure of the reducing bodies or groups present.

The method described below is essentially that reported by Staud and Gray [25] with some minor modifications by Sherrard and Davidson [26].

Solutions

Chemically pure reagents should be used in the preparation of the following solutions:

1. Fehling's solution.
   Solution A.—137 grams $CuSO_4.5H_2O$ made up to two liters with distilled water.
   Solution B.—Dissolve 692 grams Rochelle salts, $KNa(C_4H_4O_6)$, in distilled water. Add a solution of 200 grams NaOH and make up to two liters.
2. Ferric alum solution.
   Dissolve 100 grams $Fe_2(SO_4)_3.(NH_4)_2SO_4.24\,H_2O$ in 700 cc. distilled water. Add 140 cc. concentrated H_2SO_4. When the solution becomes clear make up to one liter. Twenty-five cc. should not require more than 0.3 cc. of 0.04N $KMnO_4$ to secure the end point in the titration.
3. Standard permanganate.
   0.04N $KMnO_4$ (1.2644 grams per liter.) Standardize with Bureau of Standards sodium oxalate. 1 cc. of 0.01N $KMnO_4$ = 0.00254 grams Cu.
4. Sulphuric acid, approximately 2N.

Staud and Gray's Method

Method No. 39

To a two-gram sample of pulp (oven-dry weight) is added 250 cc. H_2O in a 600 cc.. Erlenmeyer flask. Two determinations are run conveniently at the same time. The flasks are fitted with air condensers and are heated in a salt solution bath which boils at 100 degree to 101 degree C. When the contents of the flask have attained the temperature of the bath, 25 cc. of solution A and 25 cc. of solution B are mixed in a beaker and the mixture is added to the pulp. Better results are obtained by adding Fehling's solution cold than by preheating it. The flasks are shaken to insure thorough mixing. Heating is continued 45 minutes after the addition of the Fehling's solution without any further stirring. The mixture is washed from the reaction flask, is filtered while hot through an alundum crucible (porosity R. A. 98)or a Jena fritted glass crucible, and is washed with hot water. To the reaction flask is added 50 cc. ferric alum solution. This ferric alum solution is added to the pulp in the crucible in 25 cc. portions in order to dissolve the cuprous oxide. When all the Cu_2O has dissolved, the solution is drawn through the pulp into a clean flask. The pulp is washed with 50 cc. of approximately 2N H_2SO_4. The filtrate is titrated immediately with 0.04N $KMnO_4$.

Calculation

$$\frac{\text{cc. } KMnO \times N \times 0.0635}{W} \times 100 = \text{Copper number}$$

N = Normality of the $KMnO_4$ solution.
W = Weight of oven-dry sample.
1 cc. normal $KMnO_4$ = 0.0635 grams copper.

[24] A. W. Peters, J. Am. Chem. Soc. 34, 422 (1912); Schwalbe, "Chemie der Cellulose," p. 625 (1911).
[25] Ind. Eng. Chem. 17, 741, (1925).
[26] Presented before Cellulose Division of Am. Chem. Soc. Sectional Meeting at University of Wisconsin, May 29, 1926.

Acid Hydrolysis[34]
Method No. 41

This method furnishes a means of measuring the acetyl groups (CH_3CO—), although it is not certain that all the acetic acid obtained is formed by the hydrolysis of the acetyl groups.

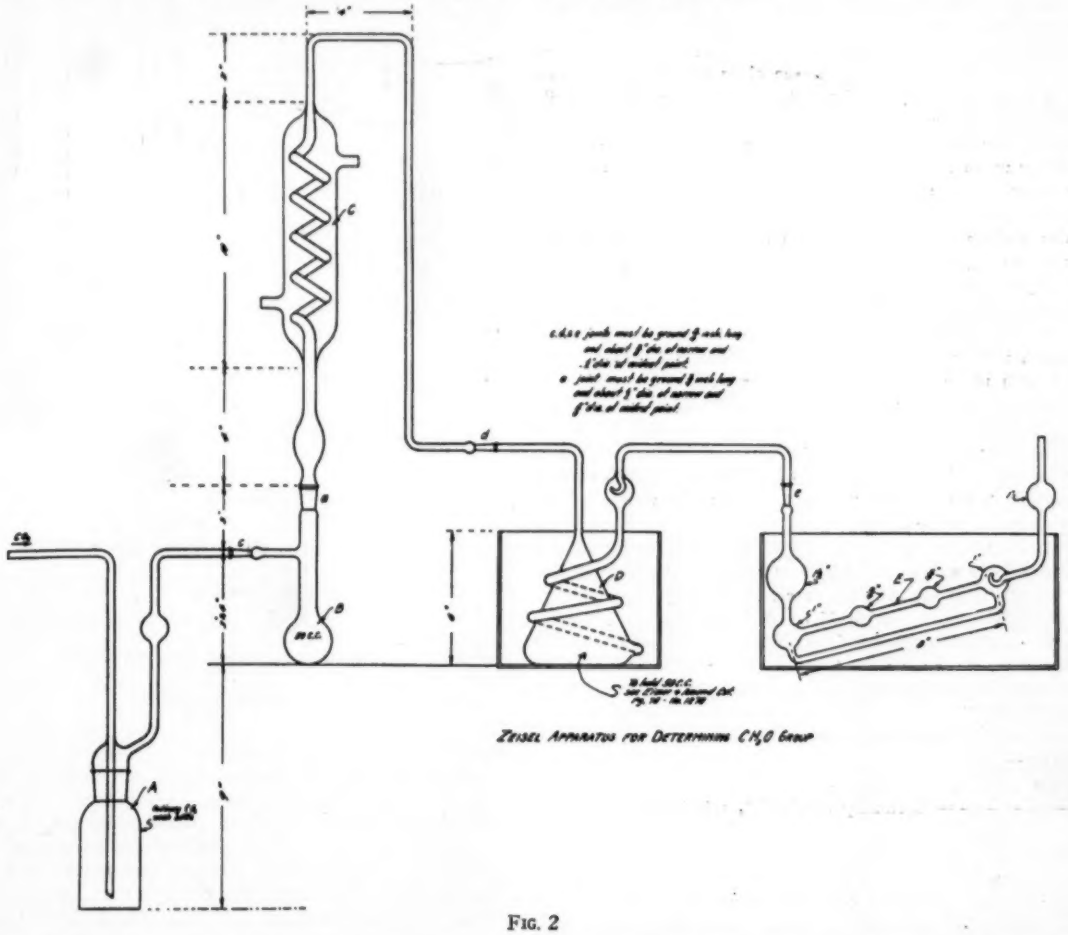
Approximately 2 grams of air-dry pulp or sawdust, the moisture content of which has been previously determined, or of oven-dry material is placed in a 250 cc. Erlenmeyer flask and 100 cc. of approximately 2.5 per cent H_2SO_4 is added. The flask is connected with a reflux condenser and the contents are boiled gently 3 hours and are then allowed to cool. The interior of the condenser is washed down with a little distilled water and the contents of the flask are transferred to a 250 cc. graduated flask. Distilled water free from carbon dioxide is added up to the graduation mark, the solution is allowed to stand several hours with frequent shaking and is then filtered.

A wide-mouthed, round-bottomed, 750 cc. flask is provided with a rubber stopper containing: (1) a dropping funnel; (2) a glass tube out to a capillary, closed with a rubber tube and pinchcock, and extending to the bottom of the flask; and (3) a Kjeldahl connecting bulb-tube. An ordinary condenser is used, to the end of which is attached for a receiver a 500 cc. distilling flask cooled with a stream of water and connected with a manometer and a suction pump.

A few pieces of pumice are placed in the boiling flask to which is added 200 cc. of the filtrate from the acid hydrolysis (in the case of hardwoods use 100 cc.). The flask is heated in an oil bath maintained at 85 degrees C., while the pressure is reduced to 40 or 50 mm. of mercury. When the residue in the flask is reduced by distilling to about 20 cc., distilled water is added through the dropping funnel, drop by drop, at the same rate that distillation takes place. When 100 cc. of solution has been distilled over, the distillate is titrated with 0.1N NaOH, using phenolphthalein as the indicator. If (a) 200 cc. or (b) 100 cc. of solution were taken for distillation, the number of cc. of NaOH used is multiplied by (a) 5/4, or (b) 5/2 respectively, and is calculated as acetic acid. The method of calculation follows:

$$\frac{\text{cc. NaOH} \times F \times N \times 0.0600}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of acetic acid}$$

F = 5/4 if 200 cc. of solution was taken for distillation.
F = 5/2 if 100 cc. of solution was taken for distillation.
N = Normality of NaOH.



ZEISEL APPARATUS FOR DETERMINING CH_3O GROUP

FIG. 2

Note: 0.0600 = Weight of acetic acid equivalent to 1 cc. of normal NaOH.

All distilled water used in this determination should be boiled previous to use in order to expel carbon dioxide.

Determination of Methoxyl Group (CH_3O-)[35]
Method No. 43

The mothoxyl groups are determined according to the method of Zeisel. This method was applied to the determination of methoxyl groups in plant fibers by Benedict and Bamberger[36]. The methoxyl determination consists essentially of heating the substance being examined with hydriodic acid, whereby methyl iodide is formed.

[35] Zeisel; Monatsh, *6*, 989 (1885); *7*, 406 (1886). R. J. Manning & M. Nierenstein, Ber. *46*, 3983, (1913). Fritz Weishut, Monatsh, *33*, 1165-12, (1912). A. Klemene, Monatsh *34*, 901-12, (1913).
[36] Benedict and Bamberger, Monatsh., *15*, 509 (1894).

The methyl iodide is swept from the reaction flask by a current of CO_2 into vessels containing an alcoholic 0.1N silver nitrate solution, the methyl iodide being decomposed with the formation of silver iodide. When only a few determinations are being made it is preferable to weigh the silver iodide directly. For a large number of determinations, the following volumetric method is recommended.

Preparation and Standardization of Solutions

The silver nitrate solution is prepared by dissolving 17 grams of the chemically pure salt in 50 cc. of distilled water and making up to a liter with previously purified 95 per cent ethyl alcohol. The aldehydes are removed from the alcohol as follows: Dissolve 1.5 grams of silver nitrate in 3 cc. of distilled water, add the resulting solution to 1 liter of 95 per cent ethyl alcohol, and shake well. Dissolve 3 grams of sodium hydroxide in about 15 cc. of 95 per cent ethyl alcohol. Warm this solution gently, cool, and add to the main solution. Shake the mixture well, allow it to settle for several days, siphon off the clear solution, and distill, adding a piece of pumice to keep the liquid from bumping.

A potassium thiocyanate solution is made up by dissolving approximately 10 grams of the chemically pure salt in distilled water and making up to 1 liter.

The silver nitrate and the potassium thiecyanate[29] solutions are standardized as follows: A known weight (0.5 g.) of chemically pure dry sodium chloride is made up to 250 cc. with distilled water; to 25 cc. portions of the salt solution, known volumes (about 15 cc.) of the alcoholic silver nitrate solution are slowly added, with constant stirring. A few drops of nitric arid are added and the solution is titrated with the solution of potassium thiacyanate, adding 5 cc. of a saturated solution of ferric alum acidified with nitric acid as the indicator. An equal volume of silver nitrate solution, to which no sodium chloride has been added, is also titrated with the potassium thiocyanate solution. The difference in the volumes of the potassium thiocyanate required in the two titrations is the equivalent of the sodium chloride added expressed in terms of silver nitrate. From the weight of the sodium chloride employed and the volumes of silver nitrate and potassium thiocyanate used, the strength of the silver nitrate and potassium thiocyanate solutions can be calculated as follows:

g = Weight in grams NaCl in 15 cc. of solution.

x = cc. KCNS equivalent to 25 cc. $AgNO_3$ solution..

Then 25 cc. $AgNO_3$ solution is equivalent to the weight (g) of NaCl + y cc.. of KCNS.

$x - y$ = cc. KCNS equivalent to (g) grams of NaCl.

$$\frac{\text{Weight NaCl}}{0.0585\,(x-y)} = \text{Normality of KCNS solution.}$$

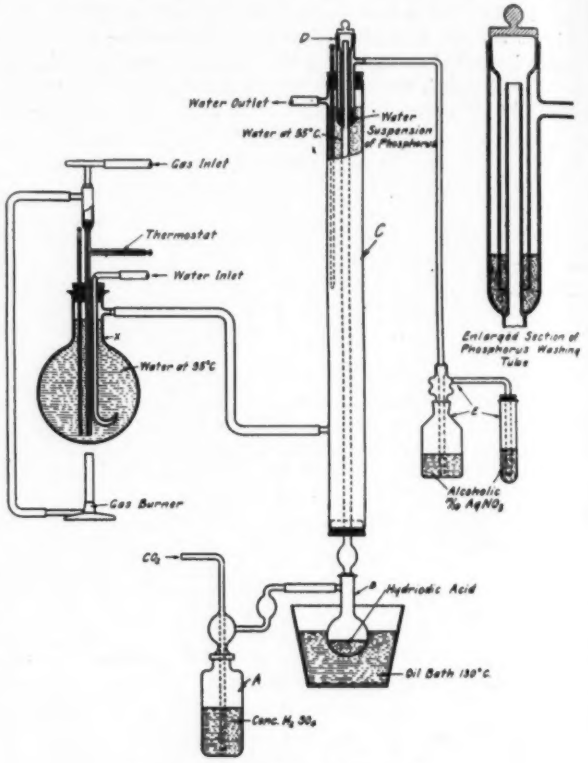
$$\frac{g}{1.4625\left(1-\frac{y}{x}\right)} = \text{Normality of } AgNO_3 \text{ solution.}$$

Method of Estimation

Either one of the two types of apparatus shown in Figs. 2 or 3 may be employed for the determination of the methoxyl groups. Fig. 3 is recommended because of its compactness and thermostatic control of temperature.

Approximately 0.3 grams of oven-dry sawdust or 0.5 gram of pulp is weighed into the digestion flask (B) and 15 cc. of redistilled hydriodic acid[30] (sp. gr. 1.70) is added. The reaction flask is heated in a glycerine bath at 130° C. In Fig. 2 a Winkler-Kyll bulb (D) containing 15 cc. of an aqueous suspension of ¼ to ½ gram of red phosphorous is shown, connected between the condenser and the absorption vessel (E). The Winkler-Kyll bulb is immersed in a water bath, which is maintained at 55° to 60° C. The temperature of the water passing through the condenser is kept at 45° to 50° C. In Fig. 3, the Winkler-Kyll bulb is replaced by a trap (D), situated at the top of the condenser containing the aqueous suspension of red phosphorous. The temperature of the water in the condenser used in this apparatus is maintained at 55° C. by means of a gas thermostat placed in a flask (X) which is connected to a water tap. The length of the tube extending from the reaction flask (B) to the trap (D) should be not less than 50 cm.

The methyl iodide is absorbed in 25 cc. of $AgNO_3$ solution



Apparatus For The Determination Of Methoxyl Group

Fig. 3

placed in the absorption apparatus (E), which is immersed in a cold water bath. A current of CO_2 gas, washed with concentrated sulphuric acid by passing through bottle (A), is passed through the apparatus at a rate of 60 bubbles per minute. (The heating is continued until the silver nitrate solution, at first milk, has become perfectly clear. This requires about 1-½ to 2 hours. The contents of the absorption bulb are washed into a beaker, diluted to 300 cc., made strongly acid with nitric acid, and boiled to decompose phosphides, etc. If the supernatant liquid is not clear at this point, it is shaken for a few minutes, and is filtered through a washed Gooch crucible. The precipitate is washed, dried to constant weight at 105° C., and weighed as silver iodide or the silver nitrate remaining may be titrated back with a standard O1N potassium thiocyanate solution. One cc. of O. 1N $AgNO_3$ is equal to 0.0031 gram of methoxyl (CH_3O). The percentage of methoxyl is calculated as follows:

x = cc. KCNS equivalent to 25 cc. $AgNO_3$.

y^1 = cc. KCNS used in back titration of $AgNO_3$ after reacting with CH_3I.

N = Normality of the KCNS solution.

$$\frac{(x-y^1)\ x\ N\ x\ 0.031}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of } CH_3O \text{ in the material}$$

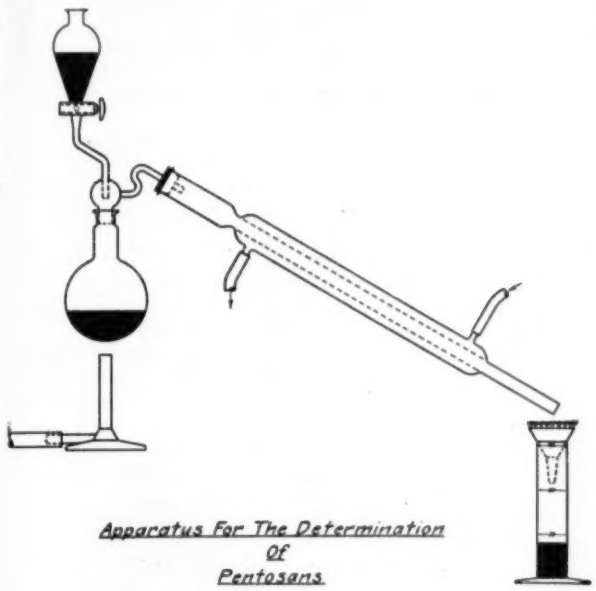
[29] Ammonium thiocyanate may be used interchangably with the potassium salt.

[30] Unless the hydriodic acid has been recently redistilled, reduction of the silver nitrate solution will occur and erroneous results will be obtained

Pentosans
Method No. 45

When substances containing pentosans are distilled with 12 per cent hydrochloric acid solution, furfural is formed. The furfural in the distillate may be precipitated with phloroglucine as furfural phloroglucide, which can be determined gravimetrically.

Two grams of air-dry or oven-dry pulp or 1.5 grams of sawdust is placed in a 250 cc. flask[31] provided with a separatory funnel and attached to a condenser as shown in Fig. 4. A small piece of paraffine and a few glass beads are placed in the flask to which is added approximately 100 cc. of 12 per cent chemically pure hydrochloric acid (sp. gr = 1.06). The contents of the flask are distilled at the maximum rate of 30 cc. in 10 minutes. (More rapid distillation gives low results.) The distillate is passed through a small filter before entering the receiver. As soon as 30 cc. of distillate is collected 30 cc. of 12 per cent HCl is added to the distillation flask and the distillation is continued in this manner until 360 cc. of distillate is collected. To the total distillate, add 40 cc. of filtered phloroglucine solution that has been prepared at least a week previously. The phloroglucine solution is prepared by heating 11 grams of chemically pure phloroglucine in a beaker with 300 cc. of 12 per cent HCl. When the phloroglucine is dissolved the solution is diluted to 1500 cc. with 12 per cent HCl. Upon addition of the phloroglucine solution to the distillate the solution soon turns greenish black. After standing 16 hours[32] the furfural phloroglucide will have settled to the bottom of the beaker. If a drop of the supernatant liquid gives a pink color with aniline hydrochloride paper[33] the precipitation of the furfural is incomplete. A further amount of phloroglucine solution is then added and the beaker allowed to stand over night again. In no case so far has it been necessary to use more than 40 cc. of phloroglucine solution.



Apparatus For The Determination Of Pentosans

FIG. 4

The furfural phloroglucide suspension is filtered using a tared Gooch crucible having a thick asbestos mat, and the cake is washed with exactly 150 cc. of cold water. The crucible is then dried for 4 hours in a water oven or for 2-½ hours in an air oven at 105° C. and is weighed in a weighing bottle. From the weight of phloroglucide found (a) the weight of pentosan present in the original sample (x) may be calculated. Then the percentage of pentosan present is calculated as follows.

$$\frac{\text{x gms. of pentosan}}{\text{Oven-dry weight of sample}} \times 100 = \text{Percentage of pentosan in the material}$$

From the weight of furfural phloroglucide obtained, the amount of pentosan present in the wood may be found, using the following tables of Kröber[34]. The table for the calculation has a range for weights of phloroglucide between 0.030 and 0.300 grams. For weights of phloroglucide outside of these limits Kröber [34] gives the following formulae:

Krobers Formula [34]

Substance sought	
	Weight of phloroglucide less than 0.030 grams
Furfural	(a* + 0.0052) × 0.517
Pentoses	(a + 0.0052) × 1.017
Pentosans	(a + 0.0052) × 0.8949
	Weight of phloroglucide 0.030 to 0.300 grams
Furfural	(a + 0.0052) × 0.5185
Pentoses	(a + 0.0052) × 1.0075
Pentosans	(a + 0.0052) × 0.8866
	Weight of phloroglucide exceeds 0.300 grams
Furfural	(a + 0.0052) × 0.5180
Pentoses	(a + 0.0052) × 1.0026
Pentosans	(a + 0.0052) × 0.8824

* a = The oven-dry weight in grams of furfural phloroglucide.

TABLE 2

KROBER'S TABLES [34] FOR THE CALCULATION OF PENTOSANS FROM FURFURAL PHLOROGLUCIDE

Phloro-g. acide	Pentosan	Phloroglucide	Pentosan	Phlorglucide	Pentosan
0.030	0.0315	0.064	0.0617	0.099	0.0926
0.031	0.0324	0.065	0.0625	0.100	0.0935
0.032	0.0333	0.066	0.0634	0.101	0.0944
0.033	0.0341	0.067	0.0643	0.102	0.0953
0.034	0.0350	0.068	0.0652	0.103	0.0962
0.035	0.0359	0.069	0.0661	0.104	0.0971
0.036	0.0368	0.070	0.0670	0.105	0.0979
0.037	0.0377	0.071	0.0679	0.106	0.0988
0.038	0.0386	0.072	0.0688	0.107	0.0997
0.039	0.0395	0.073	0.0697	0.108	0.1006
0.040	0.0404	0.074	0.0706	0.109	0.1015
0.041	0.0413	0.075	0.0714	0.110	0.1023
0.042	0.0422	0.076	0.0722	0.111	0.1032
0.043	0.0431	0.077	0.0731	0.112	0.1041
0.044	0.0440	0.078	0.0740	0.113	0.1050
0.045	0.0448	0.079	0.0749	0.114	0.1059
0.046	0.0457	0.080	0.0758	0.115	0.1067
0.047	0.0466	0.081	0.0767	0.116	0.1076
0.048	0.0475	0.082	0.0776	0.117	0.1085
0.049	0.0484	0.083	0.0785	0.118	0.1094
0.050	0.0492	0.084	0.0794	0.119	0.1103
0.051	0.0501	0.085	0.0803	0.120	0.1111
0.052	0.0510	0.086	0.0812	0.121	0.1120
0.053	0.0519	0.087	0.0821	0.122	0.1129
0.054	0.0528	0.088	0.0830	0.123	0.1138
0.055	0.0537	0.089	0.0838	0.124	0.1147
0.056	0.0546	0.090	0.0847	0.125	0.1156
0.057	0.0555	0.091	0.0856	0.126	0.1165
0.058	0.0564	0.092	0.0865	0.127	0.1174
0.059	0.0573	0.093	0.0874	0.128	0.1183
0.060	0.0581	0.094	0.0883	0.129	0.1192
0.061	0.0590	0.095	0.0891	0.130	0.1201
0.062	0.0599	0.096	0.0899	0.131	0.1210
0.063	0.0608	0.097	0.0908	0.132	0.1219
		0.098	0.0917	0.133	0.1227
0.134	0.1236	0.174	0.1590	0.214	0.1940
0.135	0.1244	0.175	0.1598	0.215	0.1948
0.136	0.1253	0.176	0.1607	0.216	0.1957
0.137	0.1262	0.177	0.1616	0.217	0.1966
0.138	0.1271	0.178	0.1625	0.218	0.1974
0.139	0.1280	0.179	0.1634	0.219	0.1983
0.140	0.1288	0.180	0.1642	0.220	0.1992
0.141	0.1297	0.181	0.1651	0.221	0.2001
0.142	0.1306	0.182	0.1660	0.222	0.2010
0.143	0.1315	0.183	0.1669	0.223	0.2019
0.144	0.1324	0.184	0.1678	0.224	0.2028
0.145	0.1333	0.185	0.1686	0.225	0.2037
0.146	0.1342	0.186	0.1695	0.226	0.2046
0.147	0.1351	0.187	0.1704	0.227	0.2054
0.148	0.1360	0.188	0.1712	0.228	0.2063
0.149	0.1369	0.189	0.1721	0.229	0.2072
0.150	0.1377	0.190	0.1729	0.230	0.2081
0.151	0.1386	0.191	0.1738	0.231	0.2089
0.152	0.1395	0.192	0.1747	0.232	0.2097
0.153	0.1404	0.193	0.1756	0.233	0.2106

[31] The flasks are made by fusing an outlet tube and a separatory funnel to the ordinary all-glass wash bottles.

[32] Boddener and Tollens (J. Landw. *58*, 232-7) have found that if the distillate containing the phloroglucine is heated to 80° to 85° C. and is then allowed to stand for 2 hours the precipitate of furfural phloroglucide can be filtered off without waiting for the solution to stand over night. The method described in the text is preferable, however.

[33] The aniline hydrochloride paper is conveniently prepared by dipping strips of filter paper into aniline hydrochloride solution. The latter is prepared by adding hydrochloric acid, drop by drop, to a mixture of equal parts of aniline and water until a clear solution is obtained.

[34] Abderhalden's "Handbuch der biochemischen Arbeitsmethoden," Vol. 2, pp. 137 and 154. J. Landw., *48*, 379 (1900). Handbook of Sugar Analysis, Browne, p. 452. Methods of Analysis of the Association of Official Agricultural Chemists (1925) p. 121 and 458.

Phloro-glucide	Pentosan	Phloroglucide	Pentosan	Phloroglucide	Pentosan
0.154	0.1413	0.194	0.1764	0.234	0.2115
0.155	0.1421	0.195	0.1773	0.235	0.2124
0.156	0.1430	0.196	0.1782	0.236	0.2132
0.157	0.1439	0.197	0.1791	0.237	0.2141
0.158	0.1448	0.198	0.1800	0.238	0.2150
0.159	0.1457	0.199	0.1808	0.239	0.2159
0.160	0.1465	0.200	0.1817	0.240	0.2168
0.161	0.1474	0.201	0.1826	0.241	0.2176
0.162	0.1483	0.202	0.1835	0.242	0.2185
0.163	0.1492	0.203	0.1844	0.243	0.2194
0.164	0.1501	0.204	0.1853	0.244	0.2203
0.165	0.1510	0.205	0.1861	0.245	0.2212
0.166	0.1519	0.206	0.1869	0.246	0.2220
0.167	0.1528	0.207	0.1878	0.247	0.2229
0.168	0.1537	0.208	0.1887	0.248	0.2238
0.169	0.1546	0.209	0.1896	0.249	0.2247
0.170	0.1554	0.210	0.1904	0.250	0.2256
0.171	0.1563	0.211	0.1913	0.251	0.2264
0.172	0.1572	0.212	0.1922	0.252	0.2272
0.173	0.1581	0.213	0.1931	0.253	0.2281
		0.254	0.2290	0.278	0.2499
		0.255	0.2299	0.279	0.2508
		0.256	0.2307	0.280	0.2517
		0.257	0.2316	0.281	0.2526
		0.258	0.2325	0.282	0.2534
		0.259	0.2334	0.283	0.2543
		0.260	0.2342	0.284	0.2552
		0.261	0.2351	0.285	0.2561
		0.262	0.2359	0.286	0.2570
		0.263	0.2368	0.287	0.2578
		0.264	0.2377	0.288	0.2587
		0.265	0.2385	0.289	0.2596
		0.266	0.2394	0.290	0.2605
		0.267	0.2403	0.291	0.2614
		0.268	0.2412	0.292	0.2622
		0.269	0.2421	0.293	0.2631
		0.270	0.2429	0.294	0.2640
		0.271	0.2438	0.295	0.2649
		0.272	0.2447	0.296	0.2658
		0.273	0.2456	0.297	0.2666
		0.274	0.2465	0.298	0.2675
		0.275	0.2473	0.299	0.2684
		0.276	0.2482	0.300	0.2693
		0.277	0.2490		

Canadian Pulp and Paper Directory

The Gardenvale Directory of the Canadian Pulp and Paper Mills and Allied Trades, published by the Industrial and Educational Publishing Company, Ltd., which also publishes the *Pulp and Paper Magazine of Canada*, Gardenvale, Quebec, is an interesting book as well as a valuable work of reference.

It contains a list of the pulp and paper mills alphabetized according to concerns in the various provinces with comprehensive information of the location, offices, personnel, capitalization, machinery, power, production, etc., of all the firms; a classified list of the products of the mills; who's who in paper; rags and paper stock dealers, printers and publishers; pulpwood merchants and contractors; list of converters; selling organizations; machinery and supply companies; producers of paper products and a number of additional lists.

There is also given a statistical survey of the industry, which contains much helpful data, and considerable other information of an historical character, which pulp and paper men frequently desire to have at hand.

A folding frontispiece presents a map of the pulp and paper mills in all the provinces of Canada.

The directory gives evidence of having been carefully edited, is bound in cloth and is well worth the subscription price of $2.00.

Knowlton Bros. Make Improvements

WATERTOWN, N. Y., December 17, 1928.—Extensive improvements are under way at the paper mill plant operated by Knowlton Brothers, Inc., in this city. A large water tank capable of storing 150,000 gallons is being constructed on Factory and Mill streets by the Chicago Bridge and Iron Works Company which will be used mainly for fire protection. The tank is being built adjoining the warehouse of the company and has been practically completed.

The Knowlton mill is equipped with apparatus for pumping water from the river in case of fires but according to the state health authorities there is slight danger of this water being pumped into the regular city water system if it became necessary to use this means in preventing the spread of fire. For this reason the company has found it necessary to construct the water supply tank, which, with the hydrant protection furnished by the city, will be ample protection for the mill.

Paper for Offset Lithography

By ROBERT F. REED[1]

The kind of paper desired by offset lithographers will have the least possible tendency to cause misregister. Expansion and contraction for which weather changes are responsible produce variations in the dimensions of the sheet, but this is not the only cause of trouble. The sheet is mechanically deformed each time it passes through the offset press due to the uniform squeeze. Therefore, if the sheet is not sufficiently rigid, this deformation will be permanent and one color will not register with the next. In such a case register may be perfect along the gripper edge but at the back of the sheet the original color will be "out" in a direction perpendicular to that of travel. In other words, the back edge of the sheet becomes longer than the gripper edge but the width remains the same.

IMPORTANT PRINCIPLES

Now as we see it, register troubles can be minimized only by attention to the following principles:

1. Preparation of the stock and formation of the sheet so that it will have the minimum tendency to expand or contract with changes in moisture content. This means slack beating and good formation.
2. Rather hard sizing to produce rigidity in the sheet. This is necessary in order to make the sheet resist permanent mechanical deformation, resulting from the squeeze. This mechanical deformation or stretch is at its worst when the moisture content of the sheet is high.
3. Paper for the lithographer should be cut with the machine direction the long way of the sheet, so that when fed into the press, the grain direction is perpendicular to the direction of travel. This accomplishes two purposes, viz.:
   a. The change in size of the sheet due to moisture variation will be greater in the smaller dimension and less in the greater dimension. This is desirable from the standpoint of register.
   b. The greater strength or rigidity of the sheet parallel to the grain direction helps to resist permanent mechanical stretch.

These are general principles which should be considered in making offset paper. They do not solve all of the problems since we do not yet know the optimum relation of the factors involved. Considerable research work remains to be done in this field and also on the problem of two-sidedness. Some paper makers believe that offset paper should be slack sized. The purpose of this seems to be to produce a sheet having the minimum tendency to curl. If two-sidedness can be minimized, however, greater rigidity can be built into the sheet without increasing its tendency to curl.

SHOULD BE FREE FROM SOLUBLE SALTS

Paper for offset lithography should be free from soluble salts, especially alum, and from acids, alkalies, or soluble soaps. Any soluble substances which may materially lower the surface tension of the dampening water used in lithography should also be guarded against. These precautions are necessary to prevent scumming or tinting of the printing plate which can sometimes be attributed to these materials.

SURFACE CHARACTERISTICS

The surface characteristics of offset paper depend entirely on trade requirements. The offset press, due to the resilience of the rubber blanket which produces the impression, is capable of printing on smooth or rough surfaces. Fuzz or fluff and loosely bound filler or coating pigment should be avoided, as they are picked up by the blanket and accumulate on the printing surfaces. Surface sizing seems to be the best method of preventing this difficulty with paper formed from weakly hydrated or slack-beaten stock.

[1] Member TAPPI. Director, Dept. of Lithographic Research, University of Cincinnati, and Research Director of Lithographic Technical Foundation.

Section of the

COST ASSOCIATION OF THE PAPER INDUSTRY

Affiliated with

THE AMERICAN PAPER AND PULP ASSOCIATION

Edited by
THOS. J. BURKE, C. A., Sec.-Treas.

How Well Do You Know Your Property*

By A. L. Etzius, American Appraisal Co., Milwaukee, Wis.

Mr. Chairman and Members of the Cost Association of the Paper Industry: I think I have a little the better of this bargain. I didn't know there was such an organization as yours before nine-fifteen on Tuesday morning. I had never heard of it before. You haven't heard of me until just now.

Mr. Baldwin I presume could have given you a real, honest-to-God speech covering the subject. I am merely a pinch-hitter. I say that in this way, because pinch-hitters are usually super-human beings who are supposed to do super-human things. They are supposed to make home runs with the bases filled and two out and three strikes on the batter, or something like that. (Laughter)

Well I am not going to try to do that, because I can't. I haven't got time. Mr. Baldwin's paper is somewhere in the air I imagine. It was air-mailed from Milwaukee to New York and I imagine sent on here, so I haven't it. I have, however, an outline, and I think we can cover some of the major points of the subject at hand.

Development of Cost Accounting

Cost accounting, as you know, is probably only a score of years old. I don't believe that it was well known even twenty years ago. There were a few isolated cases where attempts were made at keeping track of costs. Cost accounting in so far as we know the orthodox meaning of the word is probably one hundred years old.

Bookkeeping had its beginning somewhere in the Twelfth Century, although earlier efforts were made toward keeping books.

We can, therefore, summarize cost accounting as just cutting its first teeth, and accounting beginning to shave and go out nights, and bookkeeping the mother of the family, too busy, however, with the usual cooking and washing and menial duties around the house to give really much thought as to what is going on.

To illustrate some of the existing fallacies as to the proper distribution of plant expenditures, the following account of an incident may be in order. This by the way was true.

One of our staff last summer had occasion to patronize one of those sidewalk lemonade stands, of which several youthful merchants had charge. Said patronage, however, was more or less compulsory, because one of the proprietors of the stand happened to be one of his offspring.

He inquired as to the condition of the business, which brought forth the proud display of the day's receipts, running to $1.65. That was also designated as the profits for the day.

Upon questioning them as to their manufacturing cost, he received the illuminating answer that they had no costs. Jimmie's mother had furnished the lemons; Bill held up the cook for the sugar; they found the ice; and they furnished their own labor. Hence there was no cost; all profits.

He started to argue with them about the matter but thought better of it and didn't, for it so happened a short time before this, a manager of a $300,000 plant had insisted to him there was no such thing as depreciation. This was only six months ago. "While we will probably charge off some depreciation for income tax purposes, as soon as we have any earnings, it really does not exist in our property." He also elaborated upon the simplicity of their accounting system and cited his treatment of a $50,000 expenditure to prove it. It covered the tearing down and rebuilding of their power plant, rearranging and electrification of their machinery, and other changes. It bettered the property so they just capitalized the whole thing— simplicity in itself (Laughter)

This really brings us up to the subject of this talk, as to "How well Do you Know your Property"? Most of you folks are pretty well familiar with the smoke that usually comes out of the chimney, the way the office building looks, and the way the various departments are arranged inside of the several structures. But have you ever attempted to find out the component elements of the buildings and of the various units of equipment that make up a paper plant?

Paper Plant a Complex Entity

A paper plant, probably more so than the average industrial plant, is a very complex entity. In your buildings and in your equipment you have practically every kind of building materials as well as all known minerals, and they are all put together in some manner to make your plant a possibility. Your buildings may be of wood, brick, concrete, or any other combination of them. Every element of these really requires some special treatment, to keep it in its best condition and also its best efficiency.

For your use in connection with cost determination, you need tools, not mechanical tools but records tools, and those records really cannot be too complete or comprehensive.

The plant ledger that was discussed just now, I would like to see in about 99.44 per cent of all industrial plants in this country. I am sorry to say the percentage is relatively low. I have per-

* Delivered at the convention of the Cost Association of the Paper Industry, Cleveland, Ohio, October 25, 1928.

sonally assisted in the installation of a goodly number of those. But even they are of minus quantity when you consider the industrial condition of the country as a whole.

Mr. Astley outlined fully the requirements of the plant-ledger card, and I would like to amplify that,—that is that any card that might be designed for his company, even in the paper industry, might not meet the needs of a company located somewhere else, whose management had different ideas as to doing certain things or wished to accomplish additional things with that particular card. So the card itself I would say is of relatively little merit so far as the system as a whole is concerned.

As was stated, to get a real low-down as to what your plant comprises, a detailed appraisal, of course, is necessary. I happen to know that the Hammermill Paper Company is having one made. I am sorry to say we are not making it. I don't know whether Mr. Austin is present or not.

MEMBER: He is not here.

MR. ETZIUS: I met Mr. Austin some time ago and we discussed the card that you are referring to. I am very glad to see that it is being utilized.

MEMBER: Of course, it has been changed around.

MR. ETZIUS: But I mean the idea of the tabulating card.

Plant Appraisal Important

As to who shall make such an appraisal sometimes makes a difference. You men probably make it yourself. Your Plant Engineer can probably make it. And if he doesn't care to and your management doesn't care to and you have sufficient money to get one made, get an expert in that line, of course.

Just one reason why an engineer within your plant probably cannot make an appraisal of certain elements of your property as well as an expert is because he would nine times out of ten determine his values upon a square foot or cubic foot basis of value. There is a great danger in that. I will cite a little example.

Take a frame building one story high, 100 by 100 feet in size, or 10,000 square feet of floor space. The total cost of that building, using all the elements of cost—profit, engineering, and architectural fees—amounts to approximately $14,900 at today's cost or equal to about $1.49 a square foot or 12 cents per cubic foot.

Take another building identically constructed, 50 by 200 feet in size, also 10,000 feet of floor space. The total cost of that building would be approximately $17,000 and some odd dollars or $1.72 a square foot, or 14 cents a cubic foot, an increase of cost of $2,000 and some odd dollars or an increase of 15 per cent.

That is not only true of this particular building I am citing as an example, but of every structure you might find anywhere at any time.

Naturally the scientific appraisal is an answer to all of those. Within your own organizations, as you add equipment after an appraisal has been made, great care should be given to considering all of the factors that go into comprising the cost of a unit. The invoice cost to you alone is not sufficient. Freight charges should, of course, be added. Installation charges should be considered. Of course the installation charges where the units are large, such as in the paper industry, are always quite an item. They might come under the head of installation if they are unloaded at the point where the labor is going to install it, but they should be considered.

Have you ever stopped to take a paper machine apart, as to what it is made up of, from the feed box at one end to the calender at the other? I would hate to vouch a guess as to the actual number of parts in the paper machine. I never have gone that far into it.

Major Elements Comprising Paper Machine

But we have considered them in the major elements. There are some thirty major elements comprising a paper machine, each part of which lasts a life of its own. A paper machine may reasonably last fifty or more years. I have seen them older, and I suppose many of you have also.

Considering the feed box, your breast rolls, your suction boxes, your wire guides, presses, and clear back to the calenders, you will set a life to the element of each one of those major units.

By the way, before going into that, to attempt to price each one or these major elements as a portion of the total cost of that machine is no small job.

Having determined, however, the cost of each individual portion of that machine, you can readily determine an average rate for the machine as a whole. Having determined that, you may be correct and you may be just as wrong as though you had never started.

There are many reasons for that. One plant has a very high maintenance record. Immediately something goes wrong it is attended to. Another plant is very lax in its maintenance methods. I am not referring to any particular plant now. It may be lax in its maintenance methods and attend to them only when the machine won't run any longer. Maintenance in the latter case costs a lot of money, although it is sometimes very difficult to convince a plant manager of the fact, that it is expensive to let repairs go, beyond the point where they are needed.

Taking the same paper machine again, determining the life on some of these units, all the way from a few weeks to fifty years let's say for the frame, we finally arrive at a depreciation rate for the machine as a whole, of let's say for argument's sake, 3 per cent. That is only a 33-year life.

That machine has now run let's say 25 years. At the end of 25 years the machine is probably just as good for the work it is doing as it was the day it was installed and put into operation. Are you going to continue to depreciate that machine at the rate of 3 per cent a year, or are you going to make a re-analysis of it and subject it to close inspection to find out how long it will last from this time on? If you do that, you will necessarily have to change your rate of depreciation.

I think that answers the question that was brought up a while ago, that the rate itself is not a set factor in any piece of equipment, you might assign an estimated life to, when it is installed, or at the time an appraisal is made of an existing piece of equipment in your plant.

Factors of Obsolescence

There is no one living who can foretell the life of any unit. The factors of obsolescence play such an important part in all equipment, and I have been informed recently in the paper industry some great strides are being made which will obsolete a number of existing units within each of the existing paper plants today.

How to handle the obsolescence as it becomes known. Suppose that Monday morning's paper carried a headline that a new machine of a certain character to perform certain operations within your plant was perfected and it was going to be put on the market immediately, and that they were equipped to supply all those who desired such equipment.

You read about it, and what do you do? Usually nothing. The sum and substance is: Are you interested in such a machine? The new machine increases your cost in comparison with the plant which immediately is going to install the new unit. If it does, you should treat the machine you have with very careful consideration, primarily from the standpoint of obsolescence. Are you going to replace it immediately? Or will your finances allow you to do that a year hence, two years hence, or three or five?

If your management decides or you bring the point to them that you are going to continue with the existing machine for another three or five years, and the machine in question that you have within your plant is only 50 per cent depreciated, it then becomes necessary that you depreciate your machine within the time you have set as to the life you intend to operate the unit.

You will say that will increase your depreciation charge for this particular year or for the following year materially if the unit is expensive and you don't think that it is a good policy. Very

well, continue to depreciate that machine on the same basis that you have been, and buy your new machine in three years from now, and you will take the entire loss in one year. I think it is far better to attempt to forestall any such momentous charge as that in one year.

It quite frequently happens in some industries that obsolescence is such a factor that when they buy a machine today they attempt to write it off in two or three years because they know a new machine will be out in that time and they have to provide for it. So much for obsolescence.

Maintenance of Paper Charges

Having determined a so-called net rate of depreciation which attempts to retrieve your investment or cost within a certain number of years, you reach the point as to whether or not your monthly charges into your costs should also include an anticipated charge for maintenance or repair, and in some cases even for renewals of parts of major units.

To determine that, we again have to take this same machine completely apart and find out how many times each individual item of that machine must be replaced in its life and its probable cost. Major units may run the entire life of the machine. Other parts many have to be replaced three times; others twice; some five times; some once; and other smaller items, of course, so frequently that we will not consider them under that head but rather under the heading of repairs.

Taking the cost of your machine or the value of it, and determining, aside from that, the entire amount that you will have to spend on that machine in the line of renewals or repairs, you have the answer as to what the additional rate might be for the annual accrual of charges so that you can take care of the major renewals when they occur.

I am saying this from the cost accounting standpoint only. The Government will not allow you to do that in so far as the income tax is concerned. If you do, they will throw all those out and tax you for them, of course, in the year in which you make those charges, however, there is no harm in that, and there is absolutely nothing written within our law that prevents you from considering your costs and figuring them in that manner or any other you might care to.

I didn't know until Tuesday that you had made a study of depreciation rates, and I am very happy to learn that you have. I had hoped, however, that the replies to your questionnaire on depreciation would be at least 100 per cent.

I have a complete set of rates by classifications, type of building, and in a good many instances individual units that we have compiled from seventeen paper plants. These seventeen paper plants, some of which were only appraised by us once, some as high as four times, formed a nucleus for the determination of these rates. They are given here too, within the nearest quarter of one per cent.

Total Average Depreciation

You might be surprised if I told you what the total average depreciation of one particular mill is. This is not a hypocritical thing. It is an actual plant with a value of $1,631,000, and the average rate for building machinery and equipment was 3.05 per cent.

SECRETARY BURKE: Does that include obsolescence?

MR. ETZIUS: No, sir, just normal depreciation. The gross rate, or the so-called gross rate, which will provide for the maintenance and renewals of major parts of the buildings and equipment is 5.35 per cent, an increase of 2.3%.

I will say this for this particular plant, I think these rates were determined about three years ago. They were recently checked in accordance with later developments and the rate of 3.05% was increased to 3.91% for the property as a whole an increase of .86 %. That is an average rate.

SECRETARY BURKE: Are they using that average rate in their records?

MR. ETZIUS: They are using the average rate in their costs, yes. They are not using it for income tax purposes, because the Government will allow them to take far greater rates.

SECRETARY BURKE: Are they using 5.35 per cent in their costs, or are they using 3.91%?

MR. ETZIUS: They are using 6.91 per cent, so it is increased really one per cent as far as the gross rate is concerned.

SECRETARY BURKE: Do you mean 6.91 per cent or 3.91 per cent?

MR. ETZIUS: The rate they are using is 6.91 per cent because *they are anticipating their repairs in the depreciation.* So each operation is charged with a specific sum and all repairs and renewals are charged against the additional depreciation of 3 per cent.

SECRETARY BURKE: How long have they run that system?

MR. ETZIUS: I think this is the third year.

SECRETARY BURKE: How does that system work out?

MR. ETZIUS: Up to the recheck it is within one point of being correct.

SECRETARY BURKE: Do you mean .1 per cent?

MR. ETZIUS: No, one per cent. It was 5.91 per cent originally and upon the re-investigation that was increased to 6.91 per cent.

SECRETARY BURKE: Now they figure that will cover everything?

MR. ETZIUS: In accordance with past performance it will. The reason for the increase in rate was on account of the increase of labor rate and the increase in commodities entering into repairs.

MEMBER: Is that just in the period of three years?

MR. ETZIUS: That is just in the period of three years.

MEMBER: Are those figures on a paper mill or on a combination pulp and paper mill?

MR. ETZIUS: On a pulp and paper mill.

PRESIDENT KNOTT: It must be a small one, with only one million invested.

Detailed Investigation Necessary

MR. ETZIUS: I will delve a little farther into depreciation to show you the fallacy of attempting to use the blanket rate of depreciation without making a detailed investigation. Let's take buildings of $425,000, and you say, "Well I can take 2½ per cent on those as an average," and you do, producing a depreciation for the year of $10,525.

If you sat down and analyzed the buildings and accurately determined their life so far as brick buildings, frame buildings, iron-clad on steel, iron-clad on wood, and whatnot, you would probably produce a rate—I am using the same plant again— of 1.95 per cent, or a saving of $3,237.50. That is only on buildings.

If you carry that to machinery and equipment and sub-divide that by individual machines or accounts or classifications or process centers or any other known means, the saving would be materially greater than it would be on the one I have shown on buildings, because the equipment items are usually the more expensive of the two in a paper mill.

One of the hardest things I have had to contend with during the past few years was the selling of an idea as to whether to use your actual book figures for cost purposes or to use "cost of reproduction" figures for cost purposes. But as that is a subject of an entirely different character, we won't even start it. You probably have your own ideas on that, and we could devote an entire afternoon and evening and part of the next day and I think we would only scratch the surface.

SECRETARY BURKE: Did you solve the problem?

MR. ETZIUS: Sometimes..

SECRETARY BURKE: How did you solve it?

MR. ETZIUS: In my personal opinion, I would use cost of reproduction now for cost purposes.

MR. ASTLEY: You can only depreciate your book value anyway.

MR. ETZIUS: So far as the Government figures are concerned, but for cost purposes, I would figure depreciation based on cost of reproduction figures.

MR. ASTLEY: Isn't there danger if that were done because then that cost of reproduction is generally on a higher valuation than the ledger?

MR. ETZIUS: Except when you have a plant that was built in 1920.

SECRETARY BURKE: I think the idea is a good one, if you can get prices to permit a profit when using such costs.

MR. ETZIUS: I don't think you will get a great deal more in your costs on higher value if you use the rates that should be assigned to the individual items really applicable to the item itself. In other words, I mean a haphazard guess of five per cent or twenty-year life on this where it should be 33 or 35, thereby reducing the rate and producing a lesser depreciation even on the greater amount of money.

SECRETARY BURKE: In your work around the country do you find many plants working on a reproductive basis?

MR. ETZIUS: There are quite a few.

SECRETARY BURKE: The point I make is, that if you feel that that should be done, why not take the depreciation in your costs on your book value? Figure what the difference is between that depreciation and the depreciation on reproductive value and set up a reserve each year out of the profits to take care of that difference?

Individual Process Centers

MR. ETZIUS: How would you assign that to the individual process centers?

SECRETARY BURKE: It wouldn't get into the cost at all. You could make an estimate of what the cost would be if it did go into your costs. Then if you could get the money for your goods, your profits would be large enough to set up the reserve. If you couldn't, then it wouldn't. Actually putting that charge into your costs, will not make the market price any larger.

MR. ETZIUS: That is one way of doing it. But consider this. Suppose we combine and consolidate a number of paper mills. How would they be consolidated? Not on the basis of book figures, not on the basis of earning. You would undoubtedly have a reproductive cost appraisal of each of the plants and merge on that basis and figure costs on that basis.

SECRETARY BURKE: I don't agree. I think the earnings would play an important part.

MR. ETZIUS: They play their part, but you must get a common denominator. If you have a plant that was built in 1864 and is still making paper today with absolutely nothing on its books, what are you going to put that plant in as? It has a value and in so far as it is going to carry on it should be given a value.

SECRETARY BURKE: If you are going to merge them you have to get that value, but I think the profit-making possibilities in each plant will play the most important part.

MR. ETZIUS: Not so far as the merging is concerned. But as far as your cost figures are concerned, you would base that on the value at which it was turned into the new corporation.

MEMBER: I think the point Mr. Burke makes, is that it seems fairly futile to set up a reproductive cost and place your product on that basis and then go out and compete in the market. There are 99 per cent of them that don't do that.

MR. ETZIUS: I don't know whether that is true or not. In some instances it is. And in a great many others I have found this: that depreciation on property determined on the cost of reproduction basis is about as low as the amount of depreciation at the present time.

SECRETARY BURKE: If that is true, it makes a difference. What you mean is, you get more scientific facts. You do away with the "guesstimating" part of it.

MEMBER: I think if the others are still using the "guesstimating" part of it, you are at a disadvantage.

MR. ETZIUS: Let me read you a few little lines here.

Increase of Competition

"For the last two or three years we have been hearing a great deal about the increase of competition and the narrowing of profit margins. There can be no question regarding the increase of competition.

"As for the narrowing profit margins, the evidence is conflicting. On the basis of the 1925 income tax returns, the indications are that the larger firms are prospering and the smaller firms are not. However, this is beside the present point.

"The significant fact is that six years of published income tax returns show that nearly half of the corporations making a return during those years show a deficit from operations.

"In the face of this fact, *what a satisfaction it is to read from the same statistics that the pulp and paper industry, which for some years now has been making organized efforts to establish uniform cost procedure for the industry as a whole, shows by far the greater percentage of successful concerns as compared with other industries and an over-preponderance of average profits per concern in 1925.*" (Applause).

That is a fact and I imagine in the paper industry you have the same factors to overcome as practically every industry, and that is over-production.

News Print Production for November

Production of news print in Canada during November, 1928, amounted to 223,645 tons, and shipments to 233,280 tons, according to the News Print Service Bureau. Production in the United States was 123,785 tons and shipments 122,880 tons, making a total United States and Canadian news print production of 347,430 tons, and shipments of 356,160 tons. During November, 20,169 tons of news print were made in Newfoundland and 1,719 tons in Mexico, so that the total North American production for the month amounted to 369,318 tons.

The Canadian mills produced 272,985 tons more in the first eleven months of 1928 than in 1927, which was an increase of 14 per cent. The United States output was 72,186 tons, or 5 per cent less than for the first eleven months of 1927. Production in Newfoundland was 26,808 tons, or 14 per cent more, and in Mexico 2,375 tons more, making a total North American increase of 229,982 tons, or 7 per cent over the first eleven months of 1927.

During November the Canadian mills operated at 86.9 per cent of rated capacity and the United States mills at 86.6 per cent. Stocks of news print paper at Canadian mills totaled 26,254 tons at the end of November and at United States mills 34,691 tons, making a combined total of 60,945 tons, which was equivalent to 4.0 days' average production.

News of the Southeastern Trade

ATLANTA, Ga., December 17, 1928.—Hayward Beatty, Southeastern representative for the American Writing Paper Company, reports that paper merchants in Florida feel they have just been through one of their worst summers, but that indications point to much inprovement this winter. In fact, for the first time in a long period is there much disposition at all shown to discuss new lines.

It is announced that the Antietam Paper Company, Jacksonville, has been appointed a new Eagle-A Announcement Agent.

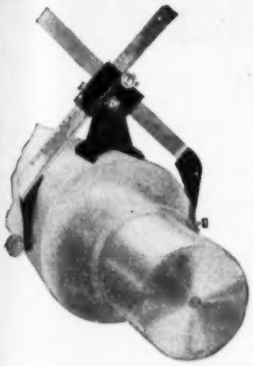
Announcement is also made that Dillard Paper Company of Greensboro, N. C., are newly appointed agents for Eagle-A Riverdale Cover.

Truman Gabbert, manager for the Birmingham branch of the Whitaker Paper Company is recovering from a bad fall sustained some weeks ago in the firms warehouse. Mr. Gabbert was severely cut and bruised and was confined to his home for some time.

Longview Fibre Co. Installs Bag Machines

[FROM OUR REGULAR CORRESPONDENT]

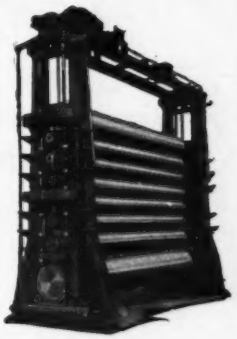
LONGVIEW, Wash., December 14, 1928.—The Longview Fibre Company has installed nine machines for making paper bags. Work has also been started preparatory to the installation of a ground wood mill which it is expected will be ready to operate by March 1, employing an additional 15 men, according to R. S. Wertheimer, resident manager. The mill now has 320 employees.



LOBDELL

Chilled Iron Calender and Press Rolls
Automatic Roll Grinding Machines
Improved Micrometer Roll Calipers

LOBDELL CAR WHEEL COMPANY
Established 1836
WILMINGTON, DELAWARE.



82 YEARS EXPERIENCE

In Making

Felts for Paper Manufacturers certainly recommends our ability to satisfactorily serve your requirements

OUR **TRIUNE** AND
MULTIPLE PLY
DRYER FELTS

English Weave—Fine Face Felt in Three, Four, Five and Six Ply—60" to 214" in width—insure large production. Absolutely no felt marks in paper.

FITCHBURG DUCK MILLS
Established 1844
FITCHBURG, MASS.

Whatever Your Needs For Steel Plate Work

Coatesville asks to quote!

For half a century Coatesville has turned out Steel Plate Work *of the highest grade* for the PAPER AND PULP INDUSTRIES.

—And Coatesville Boilers, Breechings, Tanks, Digesters, Stand Pipes, Troughs, Stacks, and Riveted Pipe are to be found throughout the Industry.

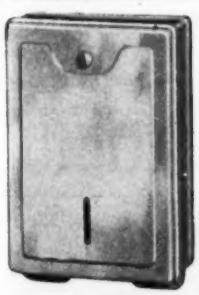
Our great experience warrants our saying: "IF IT'S MADE OF STEEL PLATE—CONSULT COATESVILLE." Our many repeat orders prove the quality of our work.

COATESVILLE BOILER WORKS

Boilers - Tanks - Steel Plate Work

Main Office and Works—COATESVILLE, PA.

Philadelphia, 111 S. 15th St.
Pittsburgh, Union Trust Bldg.
New York, 30 Church St.
Baltimore, Lexington Bldg.
Boston, 141 Milk St.
Newark, 60 Park Place



GRIFFITH-HOPE

Dispensing Cabinets
AND
Fixtures
ARE
The STANDARD of the PAPER TRADE
For Towels, Toilet, Napkins, Etc.

GRIFFITH-HOPE CO., West Allis, Wisc.

Imports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING DECEMBER 15, 1928

SUMMARY

Cigarette paper	2256 cs.
Wall paper	16 bls., 113 cs.
Paper hangings	28 bls.
News print	600 rolls
Printing paper	117 rolls, 211 cs.
Wrapping paper	10 bls., 31 cs.
Cover paper	5 cs.
Writing paper	10 cs.
Colored paper	33 cs.
Decalcomania paper	64 cs.
Transparent paper	152 cs.
Filter paper	20 bls., 40 cs.
Drawing paper	33 cs.
Photo paper	4 cs.
Baryta coated paper	105 cs.
Metal paper	10 cs.
Gold coated paper	4 cs.
Surface coated paper	235 cs.
Marble paper	8 cs.
Note paper	2 cs.
Parchment paper	8 cs.
Silk paper	35 cs.
Mould paper	2 cs.
Stencil paper and ink	85 cs.
Straw board	1107 rolls, 8 bls.
Miscellaneous paper	66 cs.

CIGARETTE PAPER

Liggett & Myers Tobacco Co., Roussillon, Bordeaux, 17 cs.
American Tobacco Co., Roussillon, Bordeaux, 200 cs.
American Tobacco Co., Indep. Hall, Bordeaux, 912 cs.
De Manduit Paper Corp., Indep. Hall. St. Nazaire, 913 cs.
P. J. Schweitzer, Pr. Polk, Marseilles, 131 cs.
British American Tobacco Co., Berengaria, Southampton, 83 cs.

WALL PAPER

F. J. Emmerich, Regina, Liverpool, 9 bls.
A. C. Dodman, Jr., Inc., G. Washington, Bremen, 2 cs.
H. Bosch & Co., Berlin, Bremen 5 cs.
Universal Car-Loading Co., Berlin, Bremen, 9 cs.
F. J. Emmerich, Minnetonka, London, 2 bls.
S. H. Pomerance, Minnetonka, London, 1 ble.
Globe Shipping Co., Hamburg, Hamburg, 4 bls.
F. J. Emmerich, Hamburg, Hamburg, 17 bls.
A. C. Dodman, Jr., Inc., Berengaria, Southampton, 23 bls.
F. J. Emmerich, Reliance, Hamburg, 2 cs., 5 bls.
J. E. Bernard & Co., Reliance, Hamburg, 25 bls.
J. E. Bernard & Co., Belgenland, Antwerp, 25 bls.

PAPER HANGINGS

A. C. Dodman, Jr., Inc., Carinthia, Liverpool, 25 bls.
W. H. S. Lloyd & Co., Minnetonka, London, 3 bls.

NEWS PRINT

Parsons & Wittemore, Inc., Berlin, Bremen, 600 rolls.

PRINTING PAPER

E. Dietzgen & Co., Ryndam, Rotterdam, 19 cs.
Dingelstedt & Co., G. Washington, Bremen, 50 cs.
Judson Freight F'd'g. Co., G. Washington, Bremen, 28 cs.
Keuffel & Esser Co., Hamburg, Hamburg, 60 rolls.
National City Bank, Hamburg, Hamburg, 116 bls.
Keuffel & Esser Co., Reliance, Hamburg, 57 rolls, 6 cs.
P. C. Zuhlke, Belgenland, Antwerp, 12 cs.

PACKING PAPER

Haule Wax Paper Manfg. Co., Hamburg, Hamburg, 29 cs.
National Consumers Paper Co., Scandaga, Rotterdam, 2 bls.

WRAPPING PAPER

Birn & Wachenheim, Belgenland, Antwerp, 31 cs., 10 bls.

COVER PAPER

International F'd'g. Co., Hamburg, Hamburg, 5 cs.

WRITING PAPER

The Eleto Co., Berengaria, Southampton, 1 cs.
Stern Bros., Berengaria, Southampton, 1 cs.
Globe Shipping Co., Berengaria, Southampton, 4 cs.
C. A. Redden, Berengaria, Southampton, 2 cs.
Distinctive Writing Paper Co., Berengaria, Southhampton, 2 cs.

COLORED PAPER

S. Gilbert, Berlin, Bremen, 27 cs.
J. Beckhard & Co., Berlin, Bremen, 5 cs.
P. H. Petry & Co., Reliance, Hamburg, 1 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Carinthia, Liverpool, 17 cs. (duplex).
C. W. Sellers, Berlin, Bremen, 1 cs.
C. W. Sellers, Harburg, Hamburg, 34 cs.
C. W. Sellers, Reliance, Hamburg, 2 cs.
L. A. Consmiller, Reliance, Hamburg, 10 cs.

TRANSPARENT PAPER

F. B. Vandegrift & Co., Carinthia, Liverpool, 13 cs.
B. F. Drakenfeld & Co., Carinthia, Liverpool, 1 cs.
Old Master Paper & Pulp Corp., Hamburg, Hamburg, 56 cs.
Old Master Paper & Pulp Corp., Reliance, Hamburg, 59 cs.
P. J. Schweitzer, Pr. Polk, Marseilles, 23 cs.

FILTER PAPER

Blackman & Blackman, Rousillon, Bordeaux, 10 bls.
E. Fougera & Co., Rousillon, Bordeaux, 34 cs.
H. Reeve Angel & Co., Inc., Minnetonka, London, 6 cs.
A. Giese & Son, Berengaria, Southampton, 10 bls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Minnetonka, London, 5 cs.
Keuffel & Esser Co., Hamburg, Hamburg, 26 cs.
Keuffel & Esser Co., Reliance, Hamburg, 7 cs.

PHOTO PAPER

J. J. Gavin & Co., Carinthia, Liverpool, 4 cs.

BARYTA COATED PAPER

Globe Shipping Co., Berlin, Bremen, 40 cs.
J. H. Schroeder Banking Corp., Reliance, Hamburg, 65 cs.

METAL PAPER

Hcnsel Bruckman & Lorbacher, Berlin, Bremen, 10 cs.

GOLD COATED PAPER

Richard Shipping Co., Berlin, Bremen, 4 cs.

SURFACE COATED PAPER

Atlantic F'd'g. Co., Hamburg, Hamburg, 11 cs.
Globe Shipping Co., Hamburg, Hamburg, 15 cs.
Phoenix Shipping Co., Hamburg, Hamburg, 4 cs.
P. C. Zulke, Belgenland, Antwerp, 130 cs.
Gevaert Co. of America, Belgenland, Antwerp, 75 cs.

MARBLE PAPER

Borden Riley Paper Co., Belgenland, Antwerp, 8 cs.

NOTE PAPER

H. Reeve Angel & Co., Inc., Minnetonka, London, 2 cs.

PARCHMENT PAPER

F. C. Strype, Patagonier, Antwerp, 2 cs.
Walker Goulard Plehn Co., Hamburg, Hamburg, 6 bls.

SILK PAPER

Meadows Wye & Co., Ryndam, Rotterdam, 35 cs.

MOULD PAPER

Phoenix Shipping Co., Ryndam, Rotterdam, 2 cs.

STENCIL PAPER AND INK

Arlac Dry Stencil Co., Hamburg, Hamburg, 85 cs.

STRAW BOARD

Haas Bros., Ryndam, Rotterdam, 52 rolls.
Massa Paper Corp., Ryndam, Rotterdam, 565 rolls.
Walker Goulard Plehn Co., Ryndam, Rotterdam, 58 rolls.
Grand Corrugated Paper Co., Ryndam, Rotterdam, 222 rolls, 8 bls.
Perkins Goodwln & Co., Ryndam, Rotterdam, 138 rolls.
A. Vuyk, Ryndam, Rotterdam, 72 rolls.

MISCELLANEOUS PAPER

Globe Shipping Co., Ryndam, Rotterdam, 27 cs.
International F'd'g. Co., Ryndam, Rotterdam, 9 cs.
E. Dietzgen & Co., Ryndam, Rotterdam, 3 cs.
H. D. Catty & Co., Hamburg Hamburg, 2 cs.
K. Beetar, Pr. Polk, Genoa, 1 cs.
Globe Shipping Co., Berengaria, Southampton, 9 cs.
Judson Freight F'd'g. Co., Reliance, Hamburg, 6 cs.
Atlantic Navigation Corp., Reliance, Hamburg, 9 cs.

RAGS, BAGGINGS, ETC.,

E. Butterworth & Co., Inc., Ryndam, Rotterdam, 122 bls. rags
American Exchange Irving Trust Co., Ryndam, Rotterdam, 105 bls. bagging.
American Exchange Irving Trust Co., Ryndam, Rotterdam, 148 bls. cotton waste.
Bank of The Manhattan Co., Ryndam, Rotterdam, 71 bls. rags.
W. Schall & Co., Ryndam, Rotterdam, 214 bls bagging.
W. Schall & Co., Ryndam, Rotterdam, 61 bls. rags.
E. J. Keller Co., Inc., Ryndam, ——, 105 bls. rags.
National Sanitary Rag. Co., Ryndam, Rotterdam, 63 bls. rags.
Castle & Overton, Inc., Caledonia, Glasgow, 39 bls. rags.
Easson Bros., Caledonia, Glasgow, 22 bls. paper stock.
J. M. Watson & Co., Caledonia, Glasgow, 68 bls. paper stock.
A. C. Fetterolf & Co., Regina, Liverpool, 43 bls. rags.
A. W. Fenton, Inc., G. Washington, Bremen, 79 bls. rags.
American Exchange Irving Trust Co., G. Washington, Bremen, 109 bls. cotton waste.
W. Steck & Co., G. Washington, 79 bls. jute waste.
Union Waste Co., G. Washington, Bermen, 22 bls. tnread waste.
W. Schall & Co., Patagonier, Antwerp, 328 bls. bagging.
E. J. Keller Co., Inc., Patagonier, ——, 55 bls. rags.
Jaffe Products Co., Primero, Havana, 25 bls. rags.
State Bank & Trust Co., Carinthia, Liverpool, 14 bls. rags.
Equitable Trust Co., Carinthia, Liverpool, 40 bls. rags.
J. Cohen & Son, Carinthia, Liverpool, 16 bls. rags.
M. Snedeker Corp., Carinthia, Liverpool, 83 bls. thread waste.
Castle & Overton, Inc., Carinthia, Ireland, 199 bls. flax waste.
Union Bank & Trust Co., Berlin, Bremen, 119 bls. rags.
W. Schall & Co., Hamburg, Hamburg, 36 bls. jute card waste.
Castle & Overton, Inc., Hamburg, Hamburg, 916 bls. rags.
American Rag Trading Co., Cabo Santa Maria, Bilbao, 69 bls. rags.
Banco Com'l Italiane Trust Co., Austvard, Genoa, 243 bls. bagging.
Whaling Waste Products Co., Austvard, Genoa, 34 bls. cotton waste.
American Exchange Irving Trust Co., Austvard, Genoa, 33 bls. cotton waste.
S. Birkenstein & Son, Austvard, Barcelona, 52 bls. rags.
S. Birkenstein & Son, Austvard, Valencia, 86 bls. rags.
Bank of The Manhattan Co., Austvard, Malaga, 55 bls. rags.
Lavin & Rosenberg, Clairton, Manchester, 16 bls. rags.
Green Hamilton & Co., Sacandaga, Rotterdam, 150 bls. cotton waste.
French American Banking Corp., Carnia, Leghorn, 47 bls. rags.
Anglo South American Trust Co., Hektor, Barcelona, 183 bls. rags.
Northern Metals Selling Co., Indep. Hall, St. Nazaire, 259 bls. rags.
Katzenstein & Keene, Inc., Indep. Hall, St. Nazaire, 95 bls. bagging.

(*Continued on page 76*)

BOLTON QUALITY

JOHN W. BOLTON & SONS, INC.

EAGLE KNIFE & BAR WORKS

Lawrence, Mass.

The only firm making KNIVES for every machine from wood pile to finishing room.

It's the KNIVES that do the work!

NOW!

PARIS BLACK EXTRA

in

FIBRE CONTAINERS

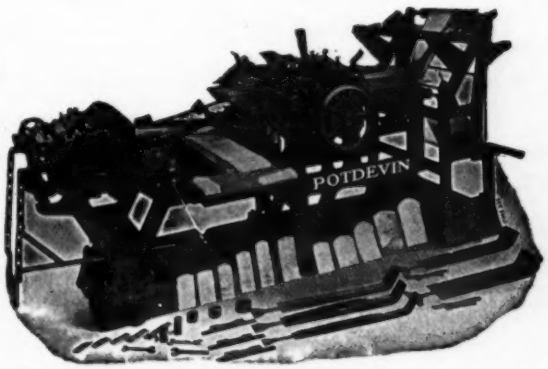
Our Paris Black Extra, made expressly for the paper industry, is now available in solid Fibre Containers, holding—four—12½ lb. Paper Bags. This represents 25% freight saving and convenience in storing and handling.

The HELLER & MERZ COMPANY
505 Hudson St., New York

287 Atlantic Ave. Boston
Chicago 146 W. Kinzie St.
Springfield, Mass. 40 Albert St.
Philadelphia 114 Market St
Factory—NEWARK, N. J.

NEW **POTDEVIN** PRINTING

SPECIALTY BAG MACHINERY



(Model 290) 2-Color Printing Flat & Square

40 Other Models

PAPER BAG MACHINERY

POTDEVIN MACHINE CO.

1223 38th Street, Dept. 4, Brooklyn, N. Y., U. S. A.
Phones: Windsor 1700-1701-1702

Union Screen Plate Company

Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

UNION BRONZE

SCREEN PLATES FOR FLAT SCREENS

6 SLOTS—5 SLOTS—4½ SLOTS—4 SLOTS—PER INCH

Old Plates Reclosed and Re-cut to Accurate Gauge

Rolled Phosphor Bronze and Copper Plates for Rotary Screens

Sole Manufacturers of the Union Witham Screen Plate Vat and Fastener

Imports of Paper and Paper Stock

(*Continued from page 74*)

Goldman Sachs & Co., Indep. Hall, St. Nazaire, 108 bls. rags.
E. J. Keller Co., Inc., Indep. Hall, ——, 64 bls. rags.
E. J. Keller Co., Inc., Minnetonka, ——, 200 bls. flax waste.
E. J. Keller Co., Inc., Exchange, ——, 161 bls. rags.
Castle & Overton, Inc., Exchester, Italy, 4 bls. rags.

OLD ROPE

American Exchange Irving Trust Co., Ryndam, Rotterdam, 47 coils.
Brown Bros. & Co., Ryndam, Rotterdam, 42 coils.
Brown Bros. & Co., Minnetonka, London, 74 coils.
Brown Bros. & Co., Cabo Santa Marta, Huelva, 163 rolls, 207 bls.
S. Birkenstein & Son, Austvard, Barcelona, 50 bls.
Bank of The Manhattan Co., Austvard, Marseilles, 37 bls.
Brown Bros. & Co., Idaho, Hull, 179 bls., 155 coils.
Furness Withy & Co., London Merchant, London, 55 coils.
Kidder Peabody Accep. Corp., Hektor, Marseilles, 67 coils.
Castle & Overton, Inc., Caledonia, Glasgow, 53 coils.

CASEIN

T. M. Duche & Sons, Primero, B. Ayres, 834 bags, 50,040 ks.

WOOD PULP

A. P. W. Paper Co. (Albany), Nord, Liverpool, N. S., 10,135 bls. wood pulp.
A. P. W. Paper Co. (Albany), Nord, Chandler, 5,600 bls. wood pulp.
A. P. W. Paper Co. (Albany), Nord, Sheet Harbor, 4,471 bls. wood pulp.
E. J. Keller Co., Inc., Hamburg, ——, 500 bls. wood pulp, 76 tons.
Castle & Overton, Inc., Hamburg, Hamburg, 916 bls. wood pulp, 137 tons.
Pagel Horton & Co., Inc., Argosy, Hornefors, 1,200 bls. sulphite, 200 tons.
M. Gottesman & Co., Inc., Sacandaga, Rotterdam, 830 bls. sulphite, 83 tons.
Castle & Overton, Inc., Reliance, Hamburg, 534 bls. wood pulp, 80 tons.
Farmers Loan & Trust Co., Ranenfjord, Oslo, 400 bls. sulphite.
Chemical National Bank, Ranenfjord, Tofte, 360 bls. sulphite.
Perkins Goodwin & Co., Ranenfjord, Drammen, 375 bls. sulphite.
J. Andersen & Co., Ranenfjord, Greaker, 2,160 bls. sulphite.
O. E. Kiaer, Ranenfjord, Greaker, 1,000 bls. sulphite.

WOOD PULP BOARDS

Lagerloef Trading Co., Reliance, Hamburg, 125 bls., 26 tons.
Lagerloef Trading Co., Hamburg, Hamburg, 78 bls.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 15, 1928

Pagel Horton & Co., Inc., Argosy, Husum, 1,500 bls. sulphite, 250 tons.
Pagel Horton & Co., Inc., Argosy, Hornefors, 1,200 bls. sulphite, 200 tons.
Paper Service Co., London Merchant, London, 2 cs., 8 rolls wrapping paper.
G. M. Graves Co., Inc., London Merchant, London, 95 coils rope.
A. H. Searle, Inc., London Merchant, London, 96 bls. rags.
Atterbury Bros., Inc., Ranenfjord, Oslo, 300 bls. wood pulp.
Farmers Loan & Trust Co., Ranenfjord, Oslo, 600 bls. sulphite.
American Exchange Irving Trust Co., Ranenfjord, Oslo, 141 bls. chemical pulp.
Chemical National Bank, Ranenfjord, Tofte, 3,360 bls. sulphite.
G. Milton Co., Inc., Indep. Hall, St. Nazaire, 117 bls. rags.
V. Galaup, Indep. Hall, St. Nazaire, 62 bls. rags.
Katzenstein & Keene, Inc., Indep. Hall, St. Nazaire, 82 bls. rags.
E. J. Keller Co., Inc., Kenbane Head, ——, 60 bls. new jute cuttings; 58 bls. threads.
Castle & Overton, Inc., Kenbane Head, Belgium, 179 bls. rags.
Castle & Overton, Inc., Ena de Lorraianga, Germany, 2,953 bls. rags.
Castle & Overton, Inc., Kiel, Denmark, 104 bls. rags.
Castle & Overton, Inc., Ambridge, Germany, 242 bls. rags.
Castle & Overton, Inc., Caledonia, England, 72 bls. rags.
Castle & Overton, Inc., Exeter City, England, 225 bls. rags.

NEW ORLEANS IMPORTS

WEEK ENDING DECEMBER 15, 1928

Castle & Overton, Inc., Exeter City, England, 225 bls. rags.

NORFOLK IMPORTS

WEEK ENDING DECEMBER 15, 1928

Old Dominion Paper Co., Ranenfjord, Drammen, 62 rolls news print.
Castle & Overton, Inc., Ene de Lorrianga, Germany, 708 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 15, 1928

Pagel Horton & Co., Inc., Argosy, Husum, 450 bls. sulphite, 75 tons; 12,930 bls. sulphate, 2,155 tons.
Pagel Horton & Co., Inc., Argosy, Hornefors, 8,340 bls. sulphite, 1,390 tons.
Baltimore Trust Co., Indep. Hall, Bordeaux, 78 bls. rags.
Congoleum Nairn Co., Indep. Hall, Bordeaux, 1,444 bls. rags.
Congoleum Nairn Co., Indep. Hall, St. Nazaire, 278 bls. rags.
Leshner Paperstock Co., Indep. Hall, St. Nazaire, 119 bls. bagging.
Bulkley Dunton & Co., Harburg, ——, 1,400 bls. wood pulp.
Castle & Overton, Inc., Ena de Lorrianga, Germany, 2,964 bls. wood pulp; 215 bls. rags.

BOSTON IMPORTS

WEEK ENDING DECEMBER 15, 1928

Bulkley Dunton & Co., Ranenfjord, ——, 400 bls. sulphite.
Farmers Loan & Trust Co., Ranenfjord, Oslo, 2,000 bls. sulphite.
American Exchange Irving Trust Co., Ranenfjord, Oslo, 560 bls. wood pulp.
Chemical National Bank, Ranenfjord, Tofte, 300 bls. sulphite.
Perkins Goodwin & Co., Ranenfjord, Drammen, 125 bls. sulphite.
O. E. Kiaer, Ranenfjord, Greaker, 250 bls. sulphite.
Bank of New York & Trust Co., Ranenfjord, Greaker, 450 bls. sulphite.
Walker Goulard Plehn Co., Ranenfjord, Sarpsborg, 20 cs. grease-proof paper.
Bulkley Dunton & Co., Kersten Miles, ——, 7,250 bls. wood pulp.
Castle & Overton, Inc., Ammon, Germany, 1,302 bls. wood pulp.
Castle & Overton, Inc., Burgerdyk, Holland, 85 bls. rags.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 18, 1928.—N. Gleason Torrey, who was purchasing agent of the Hollingsworth & Whitney Company for a long period and retired a number of years ago, is seriously ill at Phillips House, Boston. Mr. Torrey sustained a shock November 11 at the Hotel Touraine, where he was staying for the winter.

Max Zimmerman, manager of production for the United Paper Board Company, and Dean Newell, superintendent of the Benton Falls Mill of that concern, Benton Falls, Me., were at the office of the Boston agency last week.

N. F. Bartlett, traffic manager of the Hollingsworth & Vose Company, was elected a member of the board of directors of the Traffic Club of New England at the annual meeting of the organization at the Copley-Plaza Hotel, Friday evening, December 14.

Franklin F. Spaulding Entertains Salesmen

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 18, 1928.—Franklin F. Spaulding, president of the Spaulding & Tewksbury Company, box board dealers, entertained the salesmen of his company at his residence in Everett Wednesday evening, December 5. Aftr dinner, Mr. Spaulding showed the stereopticon pictures which he took during trips abroad and to the Rocky Mountains. Most of the salesmen passed the night at Mr. Spaulding's house.

Frank S. Dewey Dead

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., December 17, 1928.—Frank S. Dewey, for many years a prominent figure in the paper mill industry of Northern New York, died last Tuesday evening at his home in New York City following an attack of heart trouble. He was born at Watertown in 1876 and received his early education in the schools of that city. Following his return from the war he entered the offices of the Jefferson Paper Company at Black River where he remained two years before being appointed general manager of the Dexter Mill, operated by the same owners. He severed connections with the firm some time ago and for the past several months he had held the position as a salesman for a prominent paper company in the metropolitan territory. Burial was made in Watertown.

Applications of Pulverized Coal

Erie City Iron Works, manufacturers of steam power plant equipment, Erie, Pa., have just issued two interesting and helpful books which describe two distinct applications of pulverized coal.

Descriptions are included of the Seymour-Carbofrax Furnace, which permits industrial power plants almost unlimited load range with highest efficiencies at both limits, and the Vortex Furnace which permits the application of pulverized coal to the return tubular boiler furnace.

Copies of these booklets may be obtained gratis by writing to the Erie City Iron Works at Erie, Pa.

Fourdrinier Wires, all widths up to 300 inches

DIMOND WIRES

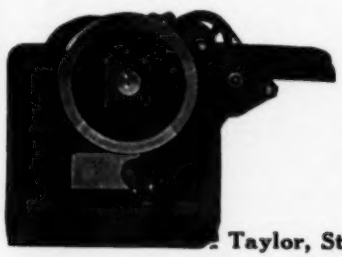
NEUMEYER & DIMOND
Established 1904
82-92 Beaver St. New York

CASEIN

Our new Casein Department is under the management of G. W. DYNE, who needs no introduction to the Coated Paper Trade.

We invite your inquiries upon Domestic. Argentine, French and other imported Caseins.

American-British Chemical Supplies Inc.
15 East 26th Street,
New York City.



TAYLOR, STILES & COMPANY GIANT RIEGELSVILLE, N.J. U.S.A.

Rag Cutters

Taylor, Stiles & Company
Riegelsville, N. J.

The

ST. REGIS PAPER COMPANY

Daily Capacity
525 TONS

Newsprint
Catalog and Directory Papers
Fibre Wrapping Papers
Packers Oiled Manila
Specialties

General Sales Office

15 Broad St., New York

Farmers' Bank Bldg.
Pittsburgh, Pa.

LOCKWOOD'S DIRECTORY
of the PAPER *and* ALLIED TRADES

1929 Edition
The 54th Consecutive Annual Issue
Corrected Up-to-Date
PRICE $7.50

CONTENTS

Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.
City Addresses of Mills and Mill supply Houses
Classified List of Paper Mill Products
Classified List of Pulp Mill Products
Coated Paper Manufacturers
Envelope Manufacturers
Glazed and Coated Paper Manufacturers
Idle Mills
Mill Officials
Pad Manufacturers
Paper Merchants
Paper Stock and Rag Dealers
Paper Bag Manufacturers
Paper Box Manufacturers
Paper Wood Pulp and Chemical Fiber Mills of the United States, Canada, Cuba, Mexico and South America
Paper Specialties Manufacturers
Papeterie Manufactures
Etc., etc., etc.

LOCKWOOD TRADE JOURNAL CO. 10 East 39th Street - New York, N.Y., U.S.A.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, December 19, 1928.

As usual at this time of the year, trading in the local paper market has quietened down considerably, and practically all the salesmen of the leading paper houses have been called off the road. The opinion is freely expressed that 1928 has been a satisfactory year, in many ways, and the outlook for the coming year is considered promising. Prices are holding to schedule, in most instances.

Conditions in the news print market are practically unchanged, and the producers have not yet agreed on the contract price for the forthcoming year, although conferences are still being held with a view to solving the problem. Operations are running at about 86 per cent of capacity in the United States and Canada. Stocks in hand at the end of November totalled 60,945 tons, according to the News Print Service Bureau.

Production of paper board is being maintained in good volume. With the exception of news and chip board, prices are holding to former levels. Demand for fine papers is seasonal and tissues are fairly active. Business in the coarse paper market is rather quiet but wrapping paper is still going forward at an excellent pace. Prices rule fairly steady and there is not much talk of concessions around.

Mechanical Pulp

The ground wood market is exhibiting an improved undertone. While most of the business transacted during the past week was along routine lines, quotations on both the imported and domestic product ruled steady and unchanged. There are apparently no undue accumulations and the outlook for the immediate future is promising.

Chemical Pulp

Steadiness prevails in the chemical pulp market. Both domestic and foreign producers are reported to be well sold ahead. Bleached sulphite is still in an exceptionally strong position. No. 1 strong unbleached imported sulphite is now quoted at from $2.50 to $2.80 and No. 2 at from $2.40 to $2.50. Domestic news sulphite is selling at from $2.40 to $2.50.

Old Rope and Bagging

Demand for old rope is being maintained in satisfactory volume. Manila No. 1 is in good request at steady prices. Mixed strings are moderately active. The bagging market is rather quiet. Not much change is anticipated until after the turn of the year. Prices remain practically unchanged and shading is infrequent.

Rags

Both domestic and imported rags are only in moderate request at present, due to the near approach of the inventory period. Cotton cuttings remain fairly active and roofing grades are going forward in a normal manner for the season. Dealers abroad are still asking high prices for the various grades of rags used in the paper mills.

Waste Paper

No radical changes have been recorded in the paper stock market, despite the approach of the Christmas holidays and the fact that the paper mills are beginning to take inventories. Book paper stock, in particular, continues in excellent demand, and a more lively request for other grades is anticipated in the near future.

Twine

Business in the twine industry was rather quiet during the past week, following an active period, due to the usual season holiday demand. Members of the twine industry are reported to be looking forward to the forthcoming year with confidence. Prices have been fairly steady and the schedule has been maintained, in most instances.

Association to Tell of Its Work

Major O. M. Porter, secretary of the American Paper and Pulp Association, has announced plans whereby the association, through a series of illustrated pamphlets, will tell of its work in the protection and promotion of the paper industry of the United States.

These pamphlets which will cover the history of the Association, its present major activities, tariff organization of the industry, its statistical services, and its Forestry and Waste Utilization work. The last pamphlet will describe the high lights of the association's 52nd Annual Meeting and Banquet, which will be held at the Waldorf-Astoria Hotel, Thursday evening, February 21, 1929, and will contain the Secretary's annual Report.

These pamphlets will present a most interesting story of the Association's work. They will be numbered and should be filed for reference in the offices of every pulp and paper mill in the United States.

To Purchase Paper in Washington

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 19, 1928.—With a view to having paper for government field offices purchased in Washington the Joint Congressional Committee on Printing has passed the following resolution:

"Resolved, That a committee consisting of one representative each of the Post Office Department, the Veterans' Bureau, the Office of the Chief Coordinator, the Government Printing Office, the Permanent Conference on Printing and the Clerk of the Joint Committee on Printing be requested to investigate and report as to the advisability and practicability of the various government activities outside of Washington, D. C., purchasing, so far as may be deemed feasible, direct from the contractor with whom the Joint Committee on Printing has made a contract, the necessary paper required for their official use."

Birds and Trees of North America

Rex Brasher, the well-known artist and author, of Kent, Conn., has published an ambitious work entitled "The Birds and Trees of North America," which contains authentic pictures, in colors, on large plates, of every North American bird and tree, printed on Normandy Vellum paper. The dimensions of the hand-colored plates are 10 inches by 14 inches.

The work consists of 12 volumes, each containing 70 hand-colored plates, and is published at $100 a volume. Members of the paper industry who have seen this ambitious work are most enthusiastic over its merits and a good number have already subscribed to it. R. S. Kellogg, of 342 Madison avenue, New York, will be very pleased to show a copy of the work to anyone interested.

SOME PAPER MILL USERS OF
Badenhausen Boilers
Superheaters :: Preheaters

Geo. F. Hardy, Consulting Engineer, New York
For Southern Paper Co., two orders, total 4700 H.P.
For St. Croix Paper Co. ..... 1200 H.P.
For Brown Paper Mill Co. ..... 3430 H.P.
Central Paper Co., Muskegon, Mich., four orders, total ..... 3100 H.P.
Philadelphia Paper Mfg. Co., Phila., three orders, total ..... 2400 H.P.
Jessup & Moore Paper Co., Phila., four orders, total ..... 4750 H.P.
Ontario Paper Co., Ltd.
For Daily Newspaper Co., North Tonawanda, N. Y. ..... 2034 H.P.
Filer Fibre Company, Filer City, Mich. ..... 1500 H.P.
John Lang Paper Co., Philadelphia, Pa. ..... 416 H.P.
Bayless Manufacturing Corp., Austin, Pa. ..... 1300 H.P.
Northern Board & Paper Co., San Francisco, Cal., two orders, total ..... 400 H.P.
Crown Willamette Paper Co., San Francisco, Cal., two orders, total ..... 750 H.P.
Delaware Hard Fibre Co., Wilmington, Del., two orders, total ..... 920 H.P.
Kieckhefer Container Co., Delair, N. J. ..... 1800 H.P.

Badenhausen Corporation

Reg. U. S. Pat. Off.
GENERAL OFFICE, 1011 CHESTNUT ST.
PHILADELPHIA, PA., U. S. A.

120 Broadway, New York — 211 Tramway Bldg., Denver
Reibald Bldg., Dayton, Ohio — 513 House Bldg., Pittsburgh
1019 Guardian Life Bldg., St. Paul

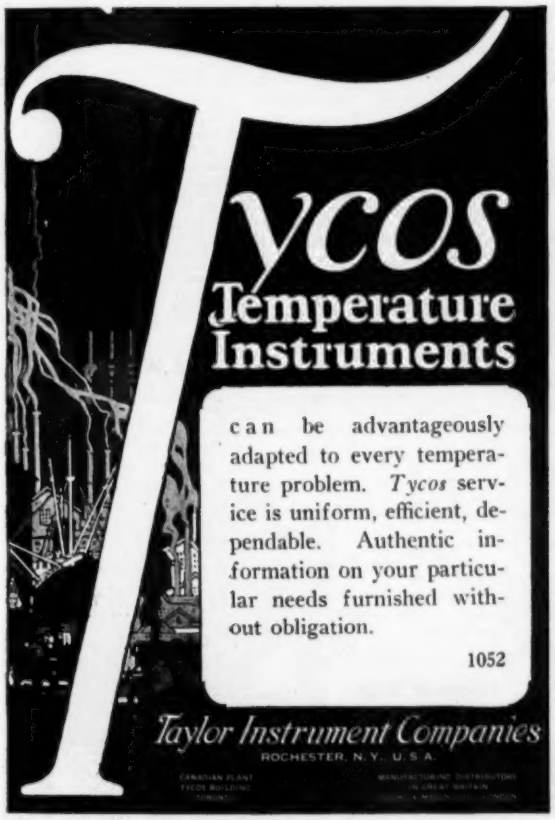
The Babcock & Wilcox Co.

85 LIBERTY STREET, NEW YORK
ESTABLISHED 1868

Water Tube Boilers Steam Superheaters
Economizers Air Preheaters
Chain Grate Stokers Oil Burners
Refractories
Seamless Tube and Piping

BRANCH OFFICES

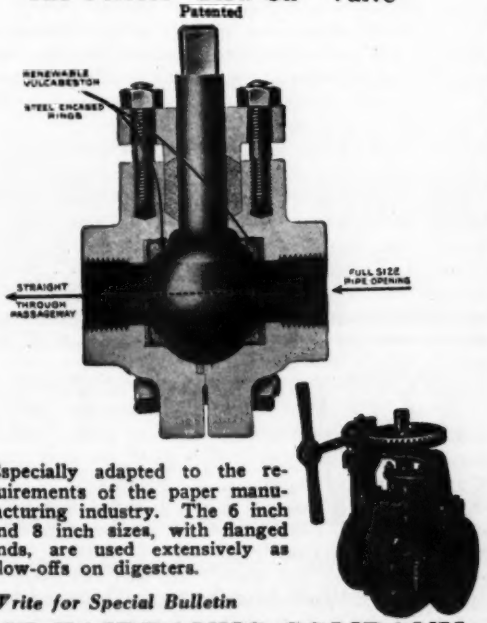
ATLANTA	Candler Building
BOSTON	80 Federal Street
CHICAGO	Marquette Building
CINCINNATI	Traction Building
CLEVELAND	Guardian Building
DALLAS, TEXAS	Magnolia Building
DENVER	444 Seventeenth Street
DETROIT	Ford Building
HOUSTON, TEXAS	Electric Building
LOS ANGELES	Central Building
NEW ORLEANS	344 Camp Street
PHILADELPHIA	Packard Building
PHOENIX, ARIZ.	Heard Building
PITTSBURGH	Farmers Deposit Bank Building
PORTLAND, ORE.	Failing Building
SALT LAKE CITY	Kearns Building
SAN FRANCISCO	Sheldon Building
SEATTLE	L. C. Smith Building
HONOLULU, T. H.	Castle & Cooke Building
HAVANA, CUBA	Calle de Aguiar 104
SAN JUAN, P. R.	Recinto Sur 51


Tycos
Temperature Instruments
can be advantageously adapted to every temperature problem. Tycos service is uniform, efficient, dependable. Authentic information on your particular needs furnished without obligation.
1052
Taylor Instrument Companies
ROCHESTER, N.Y., U.S.A.

FAIRBANKS' "SPHERO"

The Perfect "Blow-Off" Valve

Patented



Especially adapted to the requirements of the paper manufacturing industry. The 6 inch and 8 inch sizes, with flanged ends, are used extensively as blow-offs on digesters.

Write for Special Bulletin

THE FAIRBANKS COMPANY

BOSTON NEW YORK PITTSBURGH
Factory: Binghamton, N. Y.
Distribution in ALL Principal Cities

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 19, 1928.

BLANC FIXE.—The position of the blanc fixe market is unchanged. Both the pulp and the powder are in seasonal request. Prices are steady. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Conditions in the bleaching powder market are fairly satisfactory. Demand is normal for the season and contract shipments are moving at a good pace. Prices remain unaltered. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in large drums, at works.

CASEIN.—Demand for casein was light. Prices on the imported product are easier but domestic quotations are unchanged. Imported casein is quoted at from 15¼ cents to 15¾ cents per pound, while domestic casein is selling at from 15 cents to 16 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Trading in the caustic soda market was active during the past week. Prices are holding to former levels. Solid caustic soda is quoted at from $2.90 to $2.95, while the flake and the ground are selling at from $3.30 to $3.35 per 100 pounds, in large drums, at works.

CHINA CLAY.—Business in the china clay market was rather quiet. Prices on both imported and domestic grades are holding to schedule. Imported china clay is still quoted at from $15 to $25 per ton, ship side. Domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—The chlorine market is exhibiting a strong undertone. Shipments against contract are moving in excellent volume. Chlorine is quoted at 3 cents per pound, in tanks, or multi-unit cars, at works, on contract orders. The spot quotation ranges from 3¼ cents to 3½ cents per pound.

ROSIN.—Prices in the rosin market were easier. At the naval stores, the grades of gum rosin used in the paper mills are quoted at from $9.45 to $9.50 per 280 pounds, ex dock, in barrels. Wood rosin is selling at from $7.40 to $8.20 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Steadiness prevails in the salt cake market. Stocks on hand are rather limited and quotations are holding to schedule, without difficulty. Salt cake is selling at from $16 to $18 per ton, while chrome salt cake is quoted at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—The soda ash market is in a sound position. Most consumers have already booked their requirements for next year. Prices are holding to former levels. Contract quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bags, $1.32½, and in barrels, $1.55.

STARCH.—Demand for starch is about normal for the season. Prices are holding to schedule despite the prevailing reactionary trend of the grain markets. Special paper making starch is still quoted at $4.07 per 100 pounds, in bags, and at $4.24 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—During the past week trading in the sulphate of alumina market was moderately active. Prices generally remained unaltered. Commercial grades of sulphate of alumina are quoted at from $1.40 to $1.45 and iron free at from $1.90 to $2.05 per 100 pounds, in bags, at works.

SULPHUR.—The sulphur market is displaying considerable strength. Sulphur is still quoted at $18 per ton, at mine, in lots of 1,000 tons, or over, on yearly contract, and at $20 per ton for any smaller quantity over that period. On spot and nearby carloads the quotation is $21 per ton.

TALC.—Conditions in the talc market are practically unchanged. Contract shipments are moving at a normal pace. Prices remain unaltered. Domestic talc is quoted at from $16 to $18 per ton, at eastern mines. Imported talc is selling at from $18 to $20 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@45.00
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	8.00	@11.00
News—		
Rolls, contract	Nominal	
Rolls, transient	Nominal	
Sheets	Nominal	
Side Runs	Nominal	
Book, Cased—		
S. & S. C.	6.00	@ 7.50
M. F.	5.75	@ 7.00
Coated and Enamel	7.50	@12.00
Lithograph	7.50	@12.00
Tissues—Per Ream—		
White No. 1	.75	@ 1.00
Anti-Tarnish	1.35	@ 1.90
Colored	1.00	@ 2.00
White No. 2	.75	@ .80
Kraft	1.00	@ 1.10
Manila	.75	@ .80
Kraft—		
No. 1 Domestic	6.25	@ 6.50
No. 2 Domestic	4.50	@ 4.75
Southern	4.25	@ 4.50
Imported	6.50	@ 7.00
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.75	@ 5.25
No. 2 Wood	4.00	@ 4.50
Butchers	3.75	@ 4.25
Fibre Papers—		
No. 1 Fibre	5.00	@ 5.50
No. 2 Fibre	4.75	@ 5.25
Common Bogus	2.75	@ 3.00
Screenings	3.00	@ 3.25
Card Middles	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

(Delivered New York)

Boards—per ton—		
News	32.50	@45.00
Straw	52.50	@55.00
Chip	30.00	@42.50
Binders' Boards	65.00	@67.50
Sgl. Mla. Ll. Chip	45.00	@52.50
Wood Pulp	80.00	@85.00
Container	55.00	@60.00
85 Test Jute Liner	55.00	@57.50

Mechanical Pulp

(Ex-Dock)

No. 1 Imported—		
Moist	28.00	@31.25
Dry	32.00	@34.00

(F. o. b. Mill)

No. 1 Domestic	26.00	@29.00
Screenings	15.00	@20.00

Chemical Pulp

(Ex-Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.65	@ 4.40
Easy Bleaching	2.75	@ 2.90
No. 1 strong unbleached	2.50	@ 2.80
Mitscherlich unbleached	2.55	@ 3.25
No. 2 strong unbleached	2.40	@ 2.50
No. 1 Kraft	2.50	@ 2.75
No. 2 Kraft	2.40	@ 2.50
Sulphate—		
Bleached	3.75	@ 3.85

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	3.40	@ 4.75
Easy Bleaching Sulphite	2.60	@ 2.75
News Sulphite	2.40	@ 2.50
Mitscherlich	3.00	@ 3.25
Kraft (Domestic)	2.50	@ 3.30
Soda Bleached	3.15	@ 3.30
Sulphate Screenings—		
Coarse	.75	@ .95
Refined	1.50	@ 1.65

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	11.00	@11.50
New White, No. 2	8.00	@ 8.50
Silesias No. 1	7.25	@ 7.75
New Unbleached	10.50	@11.00
Washables	4.25	@ 4.75
Fancy	5.50	@ 6.00
Blue Overall	6.75	@ 7.25
New Blue Prints	5.25	@ 5.50
New Soft Blacks	5.25	@ 5.75
Mixed Khaki Cuttings	4.75	@ 5.25
Pink Corset Cuttings	8.00	@ 8.50
O. D. Khaki Cuttings	5.25	@ 5.75
Men's Corduroy	3.75	@ 4.25
New Mixed Blacks	3.50	@ 3.75

Old Rags

White, No. 1—		
Repacked	5.50	@ 6.00
Miscellaneous	4.50	@ 5.00
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.50	@ 2.75
St. Soiled, White	2.00	@ 2.15
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.75	@ 2.00
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.70	@ 1.80
No. 1	1.70	@ 1.80
No. 2	1.55	@ 1.65
No. 3	1.30	@ 1.40
No. 4	1.25	@ 1.35
No. 5A	.95	@ 1.05

Foreign Rags

New Dark Cuttings	2.50	@ 3.00
New Mixed Cuttings	2.75	@ 3.25
New Light Silesias	7.00	@ 7.50
Light Flannelettes	7.50	@ 8.00
Unbleached Cottons	10.00	@11.00
New White Cuttings	10.50	@11.50
New Light Oxfords	7.00	@ 7.50
New Light Prints	5.50	@ 6.50
No. 1 White Linens	7.25	@ 8.00
No. 2 White Linens	5.50	@ 6.25
No. 3 White Linens	4.50	@ 5.00
No. 4 White Linens	3.00	@ 3.50
Old Extra Light Prints	2.75	@ 3.25
Ord. Light Prints	2.25	@ 2.50
Med. Light Prints	1.90	@ 2.10
Dutch Blue Cottons	2.15	@ 2.30
German Blue Linens	2.50	@ 2.75
German Blue Cottons	2.00	@ 2.25
Checks and Blues	1.75	@ 1.90
Lindsay Garments	1.80	@ 1.85
Dark Cottons	1.60	@ 1.65
Old Shopperies	1.50	@ 1.55
New Shopperies	1.50	@ 1.60
French Blues	2.10	@ 2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.60	@ 1.70
Domestic	1.70	@ 1.75
Wool Tares, light	1.60	@ 1.65
Wool Tares, heavy	1.60	@ 1.65
Bright Bagging	1.60	@ 1.65
Small Mixed Rope	1.25	@ 1.40
Manila Rope—		
Foreign	3.35	@ 3.65
Domestic	3.25	@ 4.00
New Burlap Cut	2.75	@ 3.00
Hessian Jute Threads—		
Foreign	3.50	@ 4.00
Domestic	3.25	@ 3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	3.25	@ 3.50
Hard, white, No. 2	2.40	@ 2.55
Soft, White, No. 1	2.55	@ 2.65
White envelope cuttings	3.25	@ 3.50
Flat Stock—		
Stitchless	1.70	@ 1.80
Overissue Mag.	1.70	@ 1.80
Solid Flat Book	1.65	@ 1.75
Crumpled No. 1	1.15	@ 1.25
Solid Book Ledger	2.00	@ 2.10
Ledger Stock	1.70	@ 1.80
New B. B. Chips	.65	@ .75
New Env. Cut	2.40	@ 2.60
Manilas—		
New Cuttings	1.60	@ 1.85
Extra No. 1 old	1.25	@ 1.35
Print	.80	@ .85
Container	.60	@ .65
Bogus Wrapper	.75	@ .85
Old Kraft Machine Compressed bales	1.80	@ 1.90
News—		
No. 1 White News	1.75	@ 1.80
Strictly Overissue	.85	@ .95
Strictly Folded	.70	@ .75
No. 1 Mixed Paper	.50	@ .60
Common Paper	.35	@ .40

Felts for Ground Wood and Sulphite
Ease in Running and Tonnage
Equals Low Cost

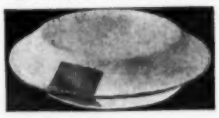
THE WATERBURY FELT COMPANY
SKANEATELES FALLS, N. Y.

Felts and Jackets—That Serve and Satisfy

A pie plate that revolutionized an industry

One big pie manufacturer recently rebuilt his trucks in order to deliver his pies on Paprus Plates rather than tins. Everywhere bakers are realizing the advantages of Paprus Pie Plates. Moulded from pulp—not pressed from paper. Paprus Pie Plates are the only absorbent pie plates that absorb and retain their shape. Get your share of the business in Paprus Pie Plates. Write for Price list.

Paprus Pie Plates used as covered container



PAPRUS
PIE PLATES

KEYES FIBRE COMPANY, INC.
General Sales Offices: GRAYBAR BLDG., NEW YORK
Factory: Waterville, Maine. JOHN M. HART COMPANY, *Manager of Sales*

Clay
400 tons daily
AMERICAN MADE FOR AMERICAN TRADE

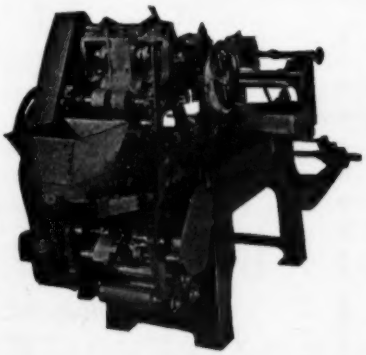
AT LAST!!

"An American Coating Clay"

H. T. Brand Coating Clay, Highest Grade Filler Clay, being used in some of the largest paper mills in the country. Send for samples and article on "***An American Coating Clay.***" Forty-three years experience in American washed clays are back of this product.

Let us submit sample and quote you.

EDGAR BROS CO.,
50 Church St.,
NEW YORK



HIGHEST SPEED
Paper Bag Machinery

Get My Quotations Before Placing Your Orders
Special Machinery Designed and Built

A. L. PARRISH
1702 Robinson St., South Bend, Ind.

Twines

(F. o. b. Mill)

No. 1	.39	@	.40
No. 2	.37	@	.38
No. 3	.36	@	.37
B. C., 18 basis	.38	@	.40
A. B. Italian, 18 basis	.48	@	.53
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrapping, 3-6 Ply—			
No. 1	.19	@	.21
No. 2	.18	@	.20
Tube Rope—			
4-ply and larger	.16	@	.17
Fine Tube Yarn—			
3-ply and larger	.21	@	.25
4-ply	.25	@	.29
3-ply	.28	@	.32
Unfinished India—			
Basis	.13	@	.14
Paper Makers Twine			
Balls	.11	@	.12
Box Twine, 2-3 ply	.15	@	.17
Jute Rope	.17	@	.19
Amer. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.16	@	.18
No. 2 Basis	.14	@	.16
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Rope	.22	@	.24

CHICAGO

All Rag Bond	.35	@	.41
No. 1 Rag Bond	.25	@	.35
No. 2 Rag Bond	.14	@	.25
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine writing	.14	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
News—Roll, mill	.03½	@	.04¼
News—Sheets, mill	.03¾	@	.04¾
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	.06¼	@	.06½
Southern Kraft	.03¾	@	.04
No. 2 Kraft	.04	@	.04¼
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue—			
24x36 Sheet	.07	@	.07¼
White Tissue—			
20x30 Sheet	.07¼	@	.07½
Boards, per ton— (Delivered Central Territory)			
Plain Chip	37.50	@	41.00
Solid News	47.50	@	—
Manila Lined Chip	55.00	@	—
Container Lined— (Delivered Central Territory)			
85 Test	65.00	@	70.00
100 Test	70.00	@	—

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.80	@	2.95
White Env. Cuttings	2.90	@	3.00
No. 1 Soft Shavings	2.50	@	2.60
No. 1 Mixed	1.00	@	1.05
No. 2 Mixed	.90	@	1.00
Ledger & Writings	1.55	@	1.65
Solid Books	1.25	@	1.35
Blanks	1.70	@	1.80
Kraffs	1.90	@	2.05
New Kraft Cuts	2.25	@	2.35
Manila Envelope Cuttings	2.00	@	2.10
Ex. No. 1 Manila	1.55	@	1.65
Print Manila	.90	@	1.00
Folded News (oversisue)	.65	@	.75
Old Newspapers—			
No. 1	.65	@	.75
No. 2	.60	@	.65
Mixed Papers—			
No. 1	.70	@	.80
Roofing Stocks— (F. o. b. Chicago, net cash)			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(F. o. b. Mill)

Bonds	.06	@	.40
Ledgers	.10	@	.40
Writings—			
Superfine	.13	@	.18
Extra fine	.20	@	.22
Fine	.18	@	.26½
Fine, No. 2	.15	@	.25
Fine, No. 3	.10	@	.20
Book, M. F.	.06	@	.07
Book, S. S. & C.	.06	@	.07½
Book, Coated	.10	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
News	.03¼	@	.04
No. 1 Jute Manila	.08½	@	.09
Manila Sul., No. 1	.04½	@	.06
Manila No. 2	.04	@	.04½
No. 2 Kraft	.06	@	.06½
No. 1 Kraft	.07	@	.07½
Common Bogus	.03	@	.03½
Straw Board	52.50	@	75.00
News Board	32.00	@	40.00
Chip Board	32.00	@	38.00
Wood Pulp Board	4.50	@	5.00

(Carload Lots)

Binder Boards—			
No. 1, per ton	75.00		
No. 2, per ton	70.00		
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	53.00	@	55.00
Slaters (per roll)	84	@	.94
Best Tarred, 1-ply (per roll)	1.85	@	1.95
Best Tarred, 2-ply (per roll)	1.44	@	1.54
Best Tarred, 3-ply	1.93	@	2.08

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.10½	@	.11
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.08½	@	.09
Black Silesia, soft	.05	@	.05½
New Unbleached	.10½	@	.11
Washable, No. 1	.04½	@	.05
Washable, No. 2	.03	@	—
Fancy			
Cottons—According to grades—			
Blue Overall	.07½	@	.08
New Blue	.03	@	.03½
New Black Soft	.05	@	.05¾
New Light Seconds	.02½	@	.03
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05½	@	.05¾
No. 2 Mixed	.04½	@	.04¾
Corduroy	.03	@	.03½
New Canvas	.08½	@	.09
New Black Mixed	.03¾	@	.04½

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	3.50	@	4.00
Sisal Rope	1.50	@	—
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	3.20	@	3.25
No. 2 Hard White	2.75	@	3.00
No. 1 Soft White	2.50	@	2.60
No. 2 Soft White	1.90	@	2.00
No. 1 Mixed	1.50	@	1.60
No. 2 Mixed	.90	@	1.00
Solid Ledger Stock	1.96	@	2.00
Writing Paper	1.65	@	1.70
No. 1 Books, heavy	1.50	@	1.60
No. 2 Books, light	1.20	@	1.25
No. 1 New Manila	2.40	@	2.50
No. 1 Old Manila	1.50	@	1.60
Print Manila	.95	@	1.00
Container Manila	.85	@	.90
Old Kraft	2.25	@	2.50
Common Paper	.50	@	.55
No. 1 Mixed Paper	.65	@	.70
Straw Board, Chip	.65	@	.75
Binders Board, Chip	.65	@	.75
Overissue News	.90	@	.95
Old Newspaper	.70	@	—

Domestic Rags (Old)

White, No. 1—			
Repacked	4.25	@	4.50
Miscellaneous	3.50	@	3.75
White, No. 2—			
Thirds and Blues—			
Repacked	2.00	@	2.00
Miscellaneous	1.60	@	1.80
Black Stockings (Export)	3.90	@	4.25
Roofing Stock—			
Foreign No. 1	1.65	@	1.75
Repacked	.02½	@	.02¾
No. 2	1.30	@	1.35
No. 3 (Roofing)	1.15	@	1.20
No. 4	1.00	@	1.10
No. 5A	.75	@	.85
B	.65	@	.75
C	.65	@	.75

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.15
Rag content	.15	@	.30
All rag	.38	@	.32½
Bonds—			
Sulphite	.16½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	65
Writings	.07	@	.20
Superfines	.11	@	.31
News	.03½	@	.04
Book, Super	.06	@	.09
Book, M. F.	.05¾	@	.08½
Book, Coated	.08½	@	.20
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.05½	@	.06½
No. 2 Kraft	.04	@	.04¾
Common Bogus	.02	@	.02¾
Delivered New England points			
Straw Boards, rolls	.009		52.50
Straw Board in Sheets, basis 35s to 70s	54.50	@	55.00
Filled News Board		@	32.50
Chip Board			30.00
Single Manila Lined Chip			45.00
Single White, Patent Coated Newsboard Bender	70.00	@	80.00
Wood Pulp Board	80.00	@	85.00
Binder Boards	70.00	@	75.00

(F. o. b. Mill)

Tarred Felts—			
Regular, carload lots	65.00	@	—

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	2.50	@	2.60
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	2.35	@	2.45
No. 1 Books, Heavy	1.55	@	1.60
No. 1 Books, Light	—	@	1.15
Manila Env. Cuttings	2.00	@	2.25
No. 1 Old Manila	1.20	@	1.25
White Blank News	1.70	@	1.75
Old Kraft	1.85	@	1.90
Print Manila	.80	@	.90
No. 1 Mixed Paper	—	@	.55
Overissue News	.85	@	.90
Old Newspapers	.65	@	.75
Box Board, Chip	.55	@	.60

Bagging

(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.50
Manila Rope—			
Foreign	4.00	@	—
Domestic	4.00	@	—
Mixed Strings	.90	@	1.00
Jute Wool Strings	—	@	1.00
Scrap Burlaps	1.50	@	1.60
Scrap Sisal	1.60	@	1.80
Scrap Sisal for shredding	1.75	@	2.00
Wool Tares, heavy	—	@	1.50
New Burlap Cutting	1.90	@	2.00

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.09	@	.10
Silesias, No. 1	.06	@	.06½
New Unbleached	.09½	@	.10
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06½	@	.06¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.04	@	.04¾
O. D. Khaki	.05	@	—
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	—	@	2.50
Thirds and Blues—			
Repacked	2.00	@	2.15
Miscellaneous	1.75	@	1.90
Roofing Stock—			
No. 1	1.65	@	1.75
No. 2	1.45	@	1.55
No. 3	1.05	@	1.10
No. 4	1.10	@	1.15

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.55	@	1.60
New No. 1 Shirt Cuttings	9.00	@	10.00
Dutch Blues	2.00	@	2.12½
Lace Curtains	5.25	@	5.40
New Checks & Blues	4.25	@	4.50
Old Fustians	1.90	@	—

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¼	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¾	@	—
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
News f. o. b. Mills—			
Rolls (carloads)	3.25	@	—
Sheets (carloads)	3.75	@	—
Sheets (2 tons or over)	4.00	@	—
Book—			
No. 1 M. F. (carloads)	7.50	@	—
No. 2 M. F. (carloads)	7.25	@	—
No. 3 M. F. (carloads)	7.00	@	—
No. 1 S. C. (carloads)	8.00	@	—
No. 2 S. C. (carloads)	7.75	@	—
No. 3 S. C. (carloads)	7.50	@	—
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	11.50	@	—
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.80	@	—
No. 1 Manila	6.65	@	—
Fiber	6.65	@	—
Kraft, M. F.	7.00	@	—
M. G.	7.00	@	—

Pulp

(F. o. b. Mill)

Ground Wood	30.00	@	31.00
Sulphite easy bleaching	62.00	@	—
Sulphite news grade	62.00	@	—
Sulphite, bleached	75.00	@	—
Sulphate	65.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.00	@	—
Soft White Book Shavings	2.85	@	—
White Blk. News	1.60	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.40	@	—
Light and Crumpled Book Stock	1.25	@	—
Ledgers and Writings	1.50	@	—
Solid Ledgers	1.50	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.80	@	—
Strictly Folded	.80	@	—
No. 1 Mixed Paper	.70	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.11½	@	—
Fancy Shirt Cuttings	.05½	@	—

Gets more heat from a pound of coal than any other combustion system
Capacities up to 700,000 pounds of steam per hour

The TAYLOR UNIT and A-E-CO FURNACE ARMOR

American Engineering Company, Philadelphia

Canadian sales and service by Affiliated Engineering Companies, Ltd., Southam Bldg., Montreal

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers.

also

Bleached Spruce Sulphite and Soda, Kraft Pulp

200 Fifth Avenue New York — 732 Sherman Street Chicago
503 Market St., San Francisco, Cal.
122 East 7th St., Los Angeles, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

BROWN COMPANY'S ALPHA GRADES

of Purified Cellulose Fibre representing some of the valuable results of our many years of research in cellulose chemistry.

SUPER ALPHA

for strength in Tear, Fold and Mullen. Super Alpha equals the higher grades of rags in the manufacture of fine papers.

EASY-BEATING ALPHA

This is a grade developed for mills of limited beating capacity. While not giving results equal to Super Alpha, it produces wonderful paper on short beating.

REGULAR ALPHA

This is a grade midway between Super and Easy-Beating.

Use ALPHA for Quality

BROWN COMPANY FOUNDED 1852 Portland, Maine

Bristol's Recording Instruments

For Pressure, Vacuum, Temperature, Liquid Level, Humidity, Speed, Electric Units, etc.

The Bristol Company Waterbury, Connecticut

BRISTOL'S RECORDING INSTRUMENTS

TANKS

Blow Pits, Acid Storage Tanks, Vats, Etc.

Send us your specifications for prompt shipment

Kalamazoo Tank & Silo Co., Kalamazoo, Michigan

Dayton High Speed Beaters

—Advantages—

Heavier Furnishes
Faster Beating
Greater Output
More Uniform Product
Saving in Power
Saving in Labor

E. K. Mansfield & Co.
501 5th Ave., New York

The Dayton Beater & Hoist Co., Dayton, O.

ELWELL-PARKER TRUCTORS

Made in types for every industrial haulage use, serving many important purposes in the paper industry. Our engineers will gladly give you the benefit of our 21 years' experience and prove how Elwell-Parker features in design and construction can meet your haulage problems.

THE ELWELL-PARKER ELECTRIC CO.

Cleveland Ohio

Paper Mill Stocks and Bonds

Quoted by Taylor & White, 45 Wall street, New York City, to whom all inquiry for quotations on these or any other Securities is referred.

BONDS	BID	ASKED
Abitibi Power & Paper 5s, 1943	90	91
Abitibi Power & Paper 6s, serially to 1934	100	102
American Writing Paper 6s, 1947	81	87
Bastrop Pulp & Paper 6½s, 1940	103	105½
Bedford Pulp & Paper 6½s, 1942	97	100
Beigo-Canadian Paper 6s, 1943	100	103
British-Columbia Pulp & Paper 6s, 1950	89	92
Brown Paper Mills Serial 6s, 1941	97	100
Brown Company 5½s, 1946	98	101
Bryant Paper 6s, 1942	98	101½
Canadian Paper Board 7s, 19337	97	99½
Cape Breton Pulp & Paper 6s, 1932	103	...
Celotex Company 6s, 1929	95	99
Celotex Company 6½s, 1939	100	102
Celotex Company of Chicago, Debenture 6s, 1936	95	98
Central Paper Company Serial 6½s, 1942	86	89
Central Paper 7s, 1934	78	...
Champion Coated Paper Serial 6½s, 1934	100	...
Champion Coated Fibre Notes 6s, 1941	100	102
Champion Fibre Notes 6s, 1941	100	102
Champion Fibre Notes 8s, 1930	95	...
Champion Paper Corp. 6s, 1945	95	98
Container Corp. of America Debenture 6s, 1936, ex-warrants	101	104
Continental Paper Products 6½s, 1943	90	99
Cornell Wood Products 7½s, 1937	103	...
Crown Willamette 6s, 1951	101	102
Dells Paper & Pulp Serial 6s, 1938	95	98
Dixon Board Mills Serial 6s, 1942	80	...
Donnaconna Paper 5½s, 1948	93	...
Eastern Manufacturing Co. 7s, 1938	97	100
Escanaba Paper Serial 6s, 1939	98	100
Escanaba Paper 6½s, 1935	96	99
Filer Fibre Serial 7s, 1935	90	95
Fort Irange Paper 7s, 1942	101	...
Fort William Paper 6s, 1946	100	104
Fraser Company 6s, 1950	103	105
Hammermill Paper Serial 6s, 1939	100	...
Hawley Pulp & Lumber 6s, 1946	96	...
Hawthorne Paper Company 6s, 1937	80	...
Hoberg Paper & Fibre 7s, 1937	94	97
Industrial Fibre Corp. Debenture 8s, 1933	100	...
Itasca Paper & Prairie River Power Serial 5½s, 1938	99½	...
Itasca Paper & Prairie River Power Serial 6s, 1938	99	...
Jessup & Moore First 6s, 1945	83	90
Kalamazoo Vegetable Parchment 6s, 1938	99	101
Lake Superior Paper 6s, 1941	105	108
Marathon Paper Mills Serial 5½s, 1942	99	101
Marinette & Menominee 7½s, 1936	103	105
Mead Pulp & Paper 5% Notes Serially, 1937	95	100
Mead Fibre 7s, 1937	97	101
Minnesota Ontario Paper Serial 6s, 1945	97½	100
Murray Bay Paper Serial 6½s, 1947	102	105
Munissing Paper Serial 6s, 1936	98	...
Nekoosa Edwards Paper 6s, 1928-42	96	...
Ontario Pulp & Paper 6s, 1931	108½	110½
Orono Pulp & Paper 6s, 1943	99	...
Orono Pulp & Paper 5s, 1941	96½	...
Oswego Falls Corp. 6s, 1941	99	102
Parker-Young Company 6½s, 1944	98	100
Paterson Parchment Paper 6s, 1938	101	103
Penobscot Chemical Fibre 6s, 1942	102	105
Port Alfred Pulp & Paper 5½s, 1947	98	100
Price Brothers 6s, 1943	105	...
Provincial Paper 5½s, 1947	98½	...
Queen City Paper 7s, 1933	98	...
River Raisin Paper 6s, 1936	98	100
Riordan Pulp & Paper 6s, 1942	102	104
Rolland Paper 6s, 1937	99	101
St. Croix Paper Serial 5s, 1937	99	...
St. Helen Pulp & Paper 6½s, 1931	99	102
St. Maurice Valley Corp. 6s, 1945	101	104
St. Maurice Valley Corp. 5½s, 1947	98½	100½
St. Regis Paper of Canada 6s,, 1931	100	101½
St. Regis Paper of Canada 6½s, 1934	100	102
Smith (Howard) Paper Mills 7s, 1941	104	106
Spanish River Pulp & Paper 6s, 1931	108	110
Stevens-Thompson Paper 6s, 1942	94	96
Taggart Brothers 6s, 1944	95	100
Tait Paper & Color Industries 6s, 1934	88	92
Ticonderoga Pulp & Paper 5s, 1930	54	...
Ticonderoga Pulp & Paper 6s, 1940	100	102
Tomahawk Kraft Paper 6s, 1938	98	...
Tomahawk Pulp Paper 7s, 1932	99	...
Tonawanda Paper 5½s, Series 1941	99	102
Union Bag & Paper Power 6s, 1932	98	100
United Wall Paper Factories 6s, 1947	96	99
Warren (S. D.) Company 6s, 1945	103	105
Watab Paper 6½s, 1942	102	...
Waterway Paper Products 6s, 1931	100	101½
Wayagamack Pulp & Paper 6s, 1951	103	105
Westfield River Paper Serial 7s, 1943	89	93
Whitmer-Parson Pulp & Lumber 8s, 1938	20	25
Whitaker Paper 7s, 1942	108	110

STOCKS	BID	ASKED
American Box Board, Pfd.	9¼	10¼
American Box Board, Com.	9¼	10¼
Am. Tissue Mills, 7% Pfd.	90	93
British Columbia P. & P. Pfd.	65	75
Brompton Pulp & Paper, 8% Pfd.	100	...
Champion Fibre, 7% Pfd.	108	110
Diem & Wing, 7% Pfd.	92	97
Eastern Mfg. Co. 1st Pfd.	55	...
Great Northern Paper, Com.	75	78
Hammermill Paper, new 6% Pfd.	100	...
Hinde & Dauch, Com.	125	None Off.
Hinde & Dauch, 6% Pfd.	102	None Off.
Holyoke Card & Paper	160	None Off.
Marathon Paper Mills, Com.	150	...
Mengel Co., Pfd.	102	104
Midwest Box Co., 8% Pfd.	98	101
Midwest Box Co., 6% Pfd.	95	99
Louis De Jonge Co., 7% Pfd.	94	97
Oxford Papers, Com.	195	...
Oxford Paper Co., Pfd.	108	111
Penobscot Chemical Fibre, Com.	80	...
Richardson Co., Com.	170	...
Sabin Robbins Paper Co., 8% Pfd.	105	110
St. Croix Paper	155	...
St. Regis Paper Co., 7% Cum. Pfd.	105	108
Westfield River Paper Co., 1st Pfd.	Wanted	None Off.
West Virginia Pulp and Paper Company	55	57
West Virginia Pulp and Paper, Pfd.	100	101
Whittaker Paper, 7% Cum. Pfd.	105	None Off.

NEWS PRINT CONFERENCES

(Continued from page 30)

daily capacity. The first unit of the new boiler plant, now being constructed at Cornwall at a cost of $300,000, will be completed by the first of next year.

The present Howard Smith company was incorporated in May of this year. Bolt, Gundy & Co. offered $150 in cash for each common share of the old company, with an alternative offer of $100 in cash and two shares of no par value common of the new company. The capital set-up of the new company consists of $7,000,000 5½ per cent first mortgage bonds, 45,000 shares of $100 par 6 per cent preferred and 200,000 shares no par common, outstanding.

The present company operates five mills in Ontario and Quebec. It also owns water powers with a developed capacity of 2,500 hp., capable of being increased to 6,900 h.p. The company also owns or controls through leasehold from the province of Quebec pulpwood areas estimated to contain more than 3,000,000 cords of pulpwood. Its present annual pulpwood requirements approximate 50,000 cords, part of which are purchases.

Clyde & Sissiboo Paper Co.

The Royal Trust Company, as receiver for the Clyde and Sissiboo Pulp Company and trustee for the bondholders, is continuing its efforts to find a purchaser for the property, but so far without success. The company's plant is at Port Clyde on the Clyde River, in Shelburne County, Nova Scotia. The plant consists of a ground wood mill, with three grinders and four wet machines, with a capacity of 27,000 (dry) lbs. per 24 hours.

The Mersey Paper Mill

Good progress is being made in the construction of the Mersey Paper Company's news print mill at Liverpool, N. S., and it is expected that the plant will be in operation next year. Four hundred men are employed on the work, and another 1,000 men are employed on the power plant being constructed by the Nova Scotia Power Commission, which will supply power for the mill.

Superior Paper Products Co. To Move

[FROM OUR REGULAR CORRESPONDENT]

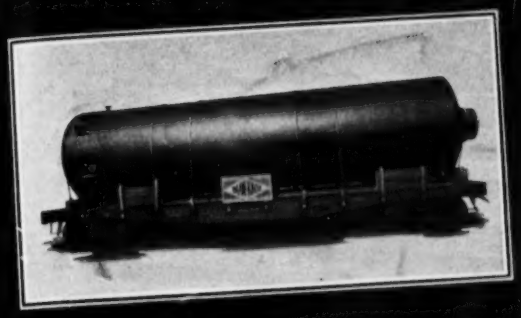
INDIANAPOLIS, Ind., December 17, 1928.—Plans are being made to move the offices and plant of the Superior Paper Products Company from Fairmount, Ind., to Marion, Ind. The plant recently was burned with a loss of about $150,000. Temporary offices have been established in the Naber Building in Fairmount but the entire business of the company will be moved as quickly as possible. The company, in a way was fortunate, for it had expected to double its force with the arrival of new machinery ordered before the fire. This machinery, already purchased, will be sent to Marion and will form the first nucleus of the new plant.

Wood Pulp Rate Decision

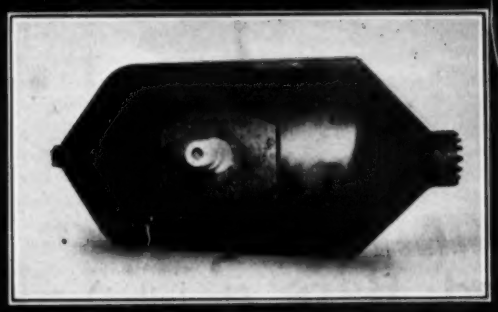
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 17, 1928.—The rate on wood pulp, in carloads, from Port Newark, N. J., to Versailles, Conn., has been found unreasonable by the Interstate Commerce Commission in a decision in the case of the Albany Perforated Wrapping Paper Company against the New York, New Haven & Hartford Railroad Company. Reasonable rates have been prescribed for the future and reparation awarded.

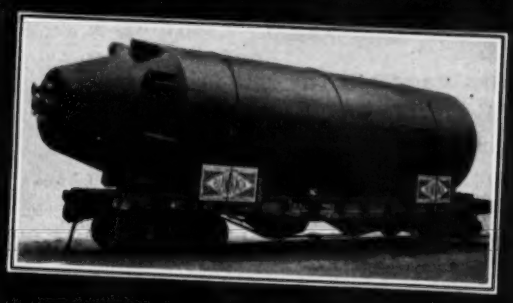
Forge and Hammerwelded
DIGESTERS



ONE PIECE



LEAKLESS



BOTTLETIGHT

BLAW-KNOX COMPANY
638 Farmers Bank Building Pittsburgh, Pa.
Offices and representatives in principal cities

BLAW-KNOX

PAPER TRADE JOURNAL
ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

FIFTY-SEVENTH YEAR

Published Every Thursday by the

LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President — J. BANNINGA, Secretary

Executive and Editorial Offices, 10 East 39th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1928, by Lockwood Trade Journal Co., Inc.

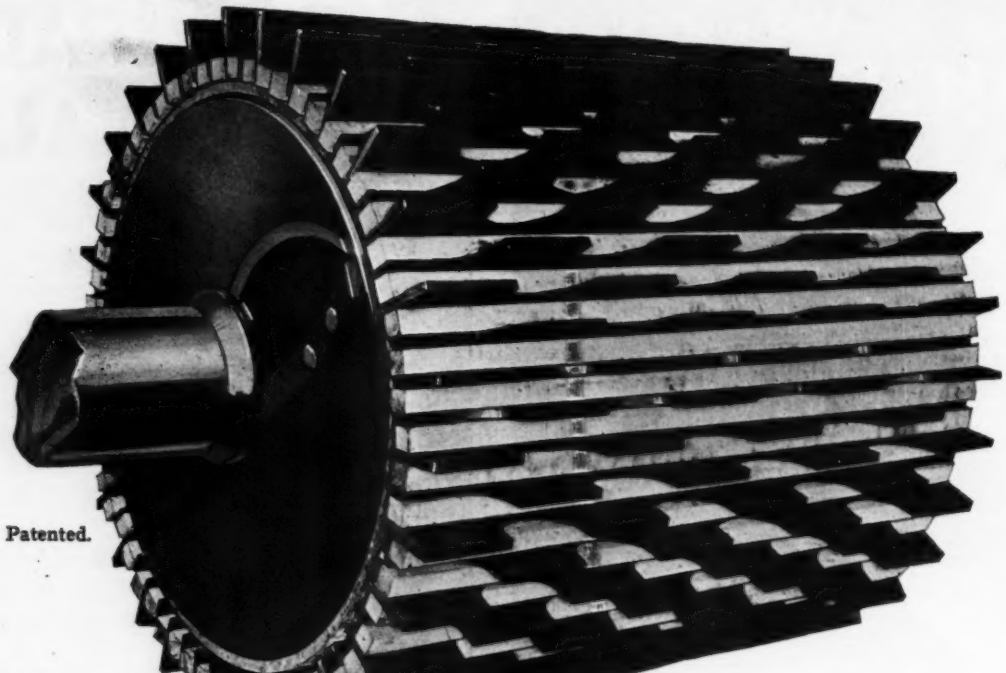
News Print Contract Price Not Yet Decided .. 15
Higher Earnings for Wayagamack 15
Pennsylvania Mills Contract Operations 16
A. Harting & Co. Expand 16
Second Unit at Port Townsend Ready 17
Continental Opens Office at Rumford 17
Track Facilities for Taggart Bag Factory 17
Wisconsin Mills Close Down for Holiday 18
Green Bay Largest Tissue Center 18
Demand for Paper Seasonal in Chicago 20
New Fort Edward Plant Nearly Completed 20
Ontario Paper Mills Continue Active 22
Dryden is Out of Receivership 22
Commercial Paper Ltd. To Build 22
Construction News 24
M. G. Benson Goes To Kingsport 26
New Companies 26
Dwyer Paper Products Builds 26
Organized Safety in the Paper Mill 28
Low Water Handicaps Corinth Mills 34
Pine Trees in Ontario District 34
Card Board Drying System 34
New York Trade Jottings 36
Editorial **38**
Bard & Fari New Non-Accident Record 39
Paper Makers Brotherhood Expands 39
Pulp and Paper Plants Welcomed by Alaska 39
I. P. Offers Stocks To Employees 39

Technical Section
Paper Board and Its Manufacture 41
Coating Paper for High Folding Test 47
Paper Board Manufacturing Problems 48
Current Paper Trade Literature 50

Cost Section **51**
C. J. Bombard Goes With Union Bag 56
Imports of Paper and Paper Stock 58
Paper Mill Stocks and Bonds **62**
New York Market Review **64**
Miscellaneous Markets **66**
Market Quotations **66**

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements 71, 72 ,73, 74



Patented.

The New Staggered Bars (Installed)

With no increase in power, in fact on many trials it shows a decrease in power used of 20%, this new bar has shown a one-third faster circulation, one-half to one-third the time in filling and absolutely no burning.

Any type of beater is suitable for this staggered bar and installation is exactly the same as with ordinary bars. By using the patented corrugated bar, staggered, a lighter bar is possible and of course has considerable more strength and brushing surface.

It will pay you to look into this.

***Corrugated* Staggered Bars Are Also Now Available**

Write for Prices

Simonds Worden White Co.

Headquarters, DAYTON, OHIO

A. A. Simonds - Dayton Co. Dayton, O. | Worden Tool Co. Cleveland, O. | L. & I. J. White Co. Buffalo, N. Y. | R. J. Dowd Knife Works Beloit, Wis.